

**TEXAS LATINO KNOWLEDGE AND ATTITUDES TOWARD NATURAL
RESOURCES AND THE ENVIRONMENT**

A Thesis

by

ANGELICA LOPEZ

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

December 2005

Major Subject: Agricultural Education

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Approved by:

Co-Chairs of Committee,	Cruz C. Torres Barry L. Boyd
Committee Member,	Nova J. Silvy
Head of Department,	Chris Townsend

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ABSTRACT

Texas Latino Knowledge and Attitudes toward Natural Resources and the Environment.

(December 2005)

Angelica Lopez, B.S.; B.S., Texas A&M University

Co-Chairs of Advisory Committee: Dr. Cruz C. Torres
Dr. Barry L. Boyd

Latinos are one of the fastest growing ethnic minority groups in the United States, and their influence on natural resource allocation and management, especially in Texas to date, has been largely ignored. For this reason, the purpose of my study was to determine Texas Latinos' attitudes toward natural resources and the environment, while considering many cultural factors often lacking in previous studies. Texas Latino community college and university students ($n = 635$) were surveyed. The survey was derived from three commonly used indices, as well as an acculturation rating scale. Of the 12 independent variables tested (ethnicity, gender, age, religious preference, religiosity, combined parent's income, parent educational level, environmental identification, political affiliation, political candidate's position on environmental issues, number of grandparents born in the United States, and acculturation level), only 6 (gender, religiosity, political candidate's position on environmental issues, combined parent income, mother's education level, and generation) were important in predicting environmental concern ($P < 0.05$). However, within group comparisons, four variables appear to be important predictors of environmental concern: gender, political candidate's position on environmental issues, mother's education, and combined parent

income. The results indicate that: women are more environmentally aware (≈ 1.5 x odds) than men; survey respondents who identified a political candidate's position on environmental issues as important had greater environmental concern (≈ 1.5 - 2.5 x odds) than those who did not; as parent combined income increased, environmental concern values also increased (≈ 2.0 - 3.0 x odds); and environmental concern values decreased with an increase in mother's education level (≈ 4.5 - 8.0 x odds). My findings suggest that demographic predictors of environmental attitudes for my sample are similar to those of other study findings. Results from my study benefit natural resource and environmental organizations in program development and implementation.

DEDICATION

For their unending support, my parents and siblings:

Anacleto, Dolores, Teto, and Julie

For their love, my husband and son:

Roel and Cristián Nóva

For their joyful spirit, my nephews and nieces:

Aaron, Avery, Aidan, Alec, Anita, and Mirna

For my brother-in-law, who left us many wonderful memories

You will be missed

With my love, I dedicate this work to you:

Albert Tijerina

ACKNOWLEDGEMENTS

Many individuals have been supportive of my goals. First, I thank the Harvey Weil Foundation for funding my thesis project. I thank Dr. Cruz C. Torres for believing in me, unquestioningly, for introducing me to a different world, and for giving me the necessary tools to build a stronger foundation. I thank Drs. Nova and Val Silvy for being surrogate parents to me and my family. I thank Dr. Barry Boyd for giving me free-reign to pursue my project and for helping me with all the formalities associated with completing my degree. I thank Dr. Eduardo Bonilla-Silva, who like Dr. Torres, has introduced me to a different world. I thank Dr. Gary Briers for letting me be a part of the agricultural education family and Dr. Joe Townsend for his words of wisdom and support. I thank Sue Melton, Debbie King, and Charlene Boggus for always being so sweet and helpful. I thank Tony Bremholm for finding those *hard to find* articles. I thank Clifton Griffin, Janice Crenshaw and Thelma Johnson for their tremendous help and support, but most especially for their kind and generous hearts. I thank Edward Romero for his friendship and help during difficult times. I thank the kind Texas professors who willingly participated in this study: Jan Bryant, Lisa Theriot, Barbara Armstrong, Karl Rimkus, Blayne Primozych, Robert Rowland, Lappoon Tang, Kim Morris-Garcia, Tom Coyle, Nora Montalvo-Liendo, Ron Nash, Ed Chambless, Veronica Galvan-Carlan, Steve Chamberlain, Beatriz Castillo, Jeanene Jones, Elizabeth Heise, Richard Cowart, Kathleen Devaney, Becky Hancock, Russell Smith, Jude Benavidez, Marvin Lovett, Sandra Murillo-Sutterby, Kevin Behr, Kyle Turman, and Tonie Badillo. I thank Michael, Elsa, and Ray for their incredible love, support, and mentorship

throughout my life. Finally, I thank my wonderful husband, Roel (amado mío), for pushing me to become a better person, and my son, Cristián Nóva, (luz de mis ojos) for letting me be a kid again.

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CHAPTER I

INTRODUCTION*

Natural resource managers continually face challenges in managing public natural resources, particularly when emerging stakeholders are ethnoculturally diverse, and may or may not share the same fundamental resource management values. Thus, a fundamental problem for natural resource managers is to recognize and consider the new stakeholder's interests in management and policy decision-making processes (Bromley 1991, Decker et al. 2001). Stakeholders ultimately will be affected by and will affect the future of natural resource management (Susskind and Cruikshank 1987, Decker et al. 2001). Understanding differences in stakeholder attitudes and knowledge toward natural resources and resource management is needed for the overall acceptance and success of management decisions made by wildlife agencies. Moreover, understanding stakeholder attitudes and knowledge base about natural resource management is essential in successfully implementing public outreach programs. Programs which ultimately foster partnerships between natural resource agencies and constituents, enhance the management of wildlife resources, and support wildlife agencies and their mission (Harris 1985, Duda and Brown 1999, Decker et al. 2001).

Latinos in the United States (U.S.) are a growing segment of the population and will undoubtedly be an important stakeholder in the future of wildlife management.

Format and style follows the Wildlife Society Bulletin.

*Part of the data reported in this chapter is in the process of being published as "Changing Hispanic demographics: challenges in natural resource management" by Roel Lopez, et al. Wildlife Society Bulletin 33(2). Copyright 2005 by The Wildlife Society and reprinted with permission.

Nationally, Latino demographics are expected to see significant changes in the next 40 years (Figure 1.1). Texas supports the second largest Latino community in the country. Latinos are expected to comprise nearly 60% of the Texas population by 2040, the majority of which are of Mexican^a descent (U.S. Census Bureau, Population Survey 2000, Murdock et al. 2003). Given this demographic trend, understanding Latino

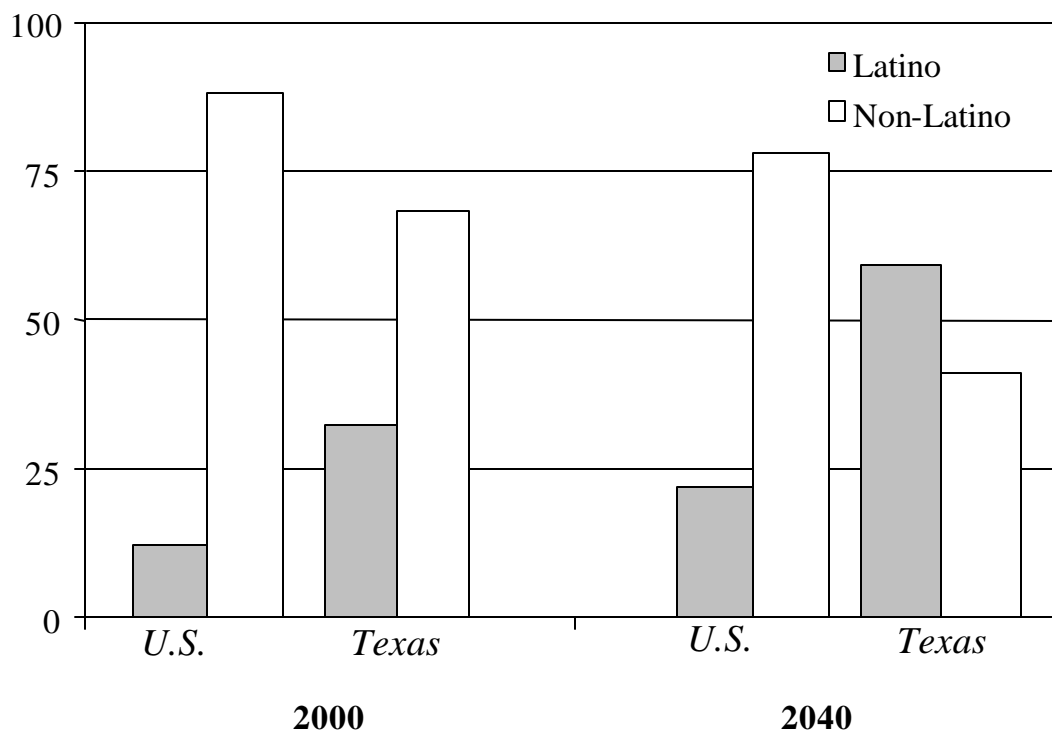


Figure 1.1. Population composition (percent) between Latinos and non-Latinos in the United States (U.S.) and Texas, 2000 and 2040 (Source: U.S. Census Bureau, Population Survey 2000).

knowledge and attitudes toward natural resources is essential to wildlife agencies if they expect to be more effective in achieving their goals of protecting and managing wildlife resources.

Today, the rapid growth of the Latino population in the U.S., specifically the Southwest, has become an important turning point in the history of environmental and natural resource attitudes, allocation, and management. The influence Latinos will have on the allocation and management of natural resources in Texas is significant. For example, Texas ranks second in the nation in hunting activities, which generates nearly \$3.6 billion to the state's economy (Brown et al. 2003). Future predictions estimate declines of 10,000–20,000 fewer Texas hunters/year, where currently <3% of hunters are Latino (Brown et al. 2003). An increase in the non-hunter Latino population with an overall decrease in hunter participation will undoubtedly impact hunting in Texas (Brown et al. 2003). Failure to engage the Latino community in wildlife conservation (e.g., hunting which financially supports many wildlife programs) will have a dramatic impact on the future of natural resources, yet there is little information regarding Latinos' natural resource and environmental attitudes and concerns. Studies concerning environment and natural resource attitudes have been conducted in response to ecological and environmental changes as a means to identify and ameliorate specific concerns (Weigel and Weigel 1978), and many surveys have been developed to determine natural resource and environmental concerns in the U.S. (e.g., Weigel and Weigel 1978, Dunlap et al. 2000, General Social Survey 2003). Yet, few if any studies

have focused exclusively on Latinos in the U.S. (Noe and Snow 1990, Schultz et al. 2000), much less Texas (Klineberg 1998).

The Latino population represents a unique group shaped by similar cultural experiences, which may include language and religion. Yet many of the more obvious similarities are artifacts of socioeconomic conditions, which include high poverty rates, lack of educational attainment, exposure to racism, and political powerlessness. Latinos also share an ascribed minority status (Not all Latinos residing in the U.S. consider themselves members of a minority group. Nevertheless, all Latinos in the U.S. have been designated as a minority population irrespective of national origin or personal orientation.) and experience some degree of residential segregation and exploitative employment. Because the Latino community is divided into several groups, a general template outlining typical Latino cultural characteristics that can be used in public outreach programs or other decision-making processes would be ideal; however, inter- and intra-group differences within the Latino culture negate such an ideal. Latinos are a diverse group that represents more than 17 different nationalities and ethnicities (Anderson 2002). Mexican, Cuban, and Puerto Rican are just the most recognizable categories of the Latino group (Figure 1.2). Differences, beside national origin, include native versus foreign-born, residency status (citizenship or other legal status), age of arrival, length of residency in the U.S., level of acculturation, and generational differences. Cultural differences among Latinos are a product of historical, socioeconomic, and political factors and are not necessarily dictated solely by demographics (Cattan 1993, Murdock et al. 2003).

A major difference among the Latino subpopulations is the initial contact experience with the host population. For example, the majority of Cubans who immigrated to the U.S. as political refugees after Fidel Castro's assumption of power in 1959 were mostly well-educated professionals of the upper and middle classes during the 1952–1959 Batista rule (Cattan 1993). Accepted as political refugees, Cubans

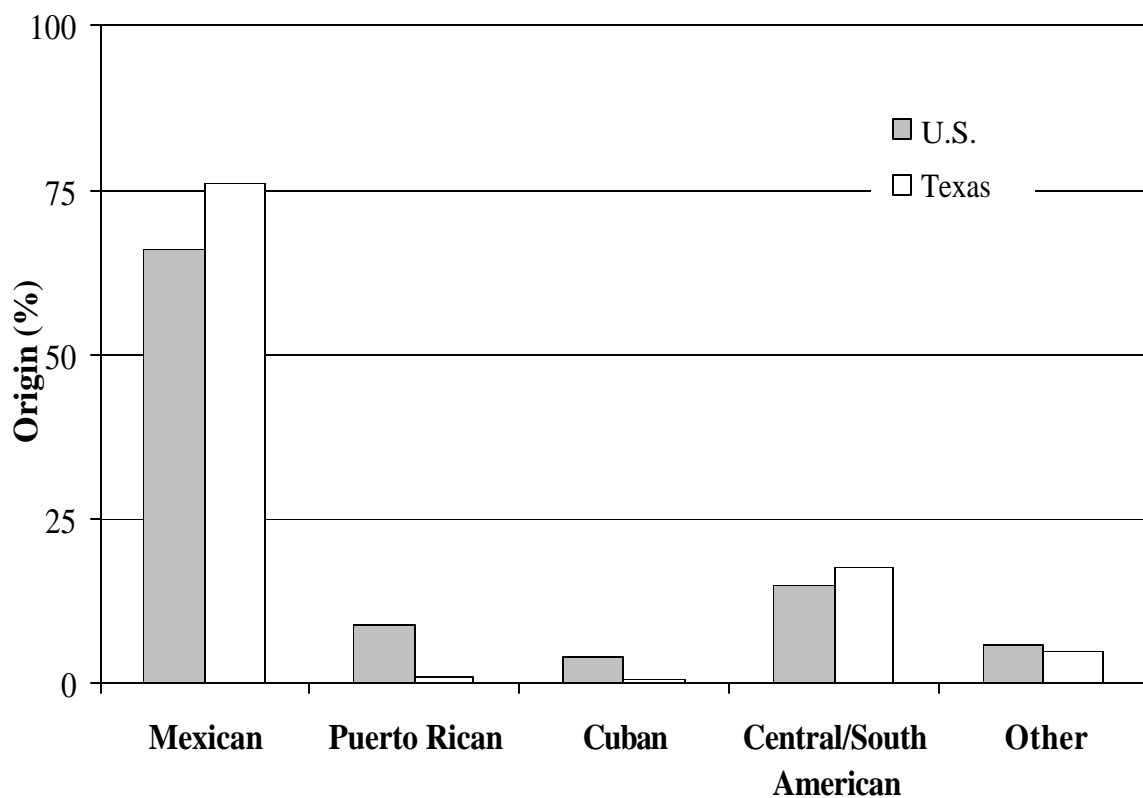


Figure 1.2. Latinos by origin (percent) in the United States (U.S.) and Texas, 2000
(Source: U.S. Census Bureau, Population Survey 2000).

primarily settled in southern Florida. In contrast, early Mexicans living in the U.S. were not immigrants (Cattan 1993). Following the end of the Mexican War and the signing of

the Treaty of Guadalupe Hidalgo (1848) Mexicans living on lands that were originally part of northern Mexico instantly became conquered second-class U.S. citizens. The next major influx of Mexicans immigrated to the U.S. following the Mexican Revolution (1910–1917). Mexicans continued to immigrate to the U.S. for economic rather than political reasons. These new immigrants, in general, were less educated and poorer than political refugees, i.e., Cuban immigrants (Montejano 1987, Cattán 1993).

When comparing Cuban and Mexican populations in the U.S., it is not surprising that significant differences in cultural values and behaviors exist between these 2 groups. These differences reflect the historical, socioeconomic, and political factors and experiences of the 2 groups (Cattán 1993). Regardless of origin, the result remains the same; the differences render the use of a single public outreach model inappropriate and ineffective (Burroughs and Reeff 1996). These expected cultural differences among Latino groups are an important factor to keep in mind in the development of wildlife conservation programs. A successful outreach program in Florida with a predominantly Cuban population may not be applicable in Texas with a predominantly Mexican population (Burroughs and Reeff 1996).

Moreover, it is tempting to consider a specific Latino subgroup (e.g., Mexicans) to be a homogeneous group; however, there are significant cultural differences even within a Latino subgroup. For example, differences in historical and socioeconomic factors between “Hispanos” (term used to identify New Mexican Latinos) and “Tejanos” (term used to identify Texas Mexicans) result in a different set of cultural values and beliefs. In New Mexico, which was annexed without a single shot fired (Acuña 1988),

Hispanos have never been a numerical minority in the state; in fact, New Mexico is ranked number 1 in percent population that is Hispanic. Furthermore, a large number of Hispanos belong to the middle and upper classes, enjoy strong political representation, and access to educational and economic opportunities (Valdez 1995). In contrast, Mexicans in Texas experienced a turbulent history with Anglos that ended with the violent displacement of Mexicans, who then became a conquered minority, following the Mexican American War (Acuña 1988). The Tejano population has larger numbers in the lower class, with limited political representation, and limited educational and economic opportunities (Montejano 1987, see Acuña 1988 for a comprehensive review of differences). Today, Tejanos remain an ethnocultural minority in Texas. Finally, cultural characteristics vary within a Latino subgroup (e.g., Tejanos) also can differ due to generational differences and levels of acculturation (Marín and Marín 1991). For example, the cultural experiences of a first-generation Mexican-American differ substantially from those of a third-generation Mexican-American due to exposure in the U.S. education system and labor force participation, which may affect language, income, family values, language, and political activity (Burroughs and Reeff 1996, Marín and Gamba 1996, Schultz et al. 2000). Thus, given these geopolitical differences, it is not surprising that cultural differences exist within the same Latino subgroup.

To date, few natural resource outreach programs target the Latino population. So while understanding the Latino culture can be useful to wildlife agencies in accomplishing their conservation mission, this understanding is challenged not only by the complexity of the Latino culture, but also by the lack of agency experience with

these underserved populations. Additionally, because the Latino community differs from its non-Latino counterpart in many important socioeconomic and political factors (Table 1.1), there is a need to determine Latino knowledge and attitudes toward natural resources and the environment.

Table 1.1. Demographic comparison between Latino and non-Latino whites, 2005.

Characteristic	Latino	Non-Latino White
Median Age (years)	25.9	36.9
Family size	3.9	3
Education (>25 years of age)		
High School Diploma (%)	63	95
College Degree (%)	11	28
Households below poverty level (%)	23	8
Median Family Income (\$)	34,396	54,698
Language(s) Spoken	Spanish and English	English

Previous research indicates that factors, such as age, gender, education, and political orientation determine natural resource and environmental attitudes (Klineberg 1998). In Latino populations, these factors may be compounded by additional factors, acculturation and generation, that influence Latino attitudes and concerns, but that are not relevant to the non-Latino community. This is important because if these are not included, these ethnic specific factors, may lead to an inadequate model to determine

Latino attitudes and concerns toward the environment and natural resources. A new model is needed, one that will specifically determine Latino attitudes toward the environment and natural resources by incorporating additional variables that are specific to the Latino population.

Thus, the objective of my study is two-fold. First, I provide a review of the current state of knowledge regarding Latino attitudes toward natural resources and the environment (Chapter II). Second, I determine environmental and natural resource attitudes and concerns for a sample of Texas Latino community college and university students (Chapter III). Finally, I conclude with a review of my findings and recommendations (Chapter IV). Chapters II and III are written as independent, stand-alone papers, each having a different research objective; however, a shared goal between Chapters II and III is to increase our knowledge of Latino attitudes toward natural resources and the environment, hence some repetition between these chapters occurs.

CHAPTER II

LITERATURE REVIEW: LATINOS AND NATURAL RESOURCES

Synopsis

Understanding differences in stakeholder attitudes and knowledge is needed for the overall acceptance and success of management decisions made by wildlife agencies. To implement public outreach programs, which foster partnerships between the agency and its constituents, an understanding of stakeholder attitudes and knowledge toward natural resources and the environment is essential. Building rapport with stakeholders, in turn, will increase support towards wildlife agencies and their mission, thus improving the management of wildlife and natural resources. Increasingly, Latinos will be the stakeholders wildlife agencies need to target in these outreach programs because the Latino community is one of the fastest growing ethnic groups in the U.S.. Yet research on Latino environmental and natural resource attitudes is limited. A literature search conducted in 2004 yielded 17 articles that specifically related to Latinos, attitudes, natural resources, and the natural environment. I found the field of recreation and leisure has conducted more research on Latinos than the wildlife and natural resource disciplines. Furthermore, studies that exist in the wildlife, natural resource, and environmental fields do not incorporate key cultural characteristics of the Latino population that influence attitude formation. As a result, there is little knowledge regarding Latinos and their attitudes toward natural resources, wildlife, and the environment because previous studies in these disciplines have failed to adequately measure Latino attitudes.

Introduction

In the U.S., Latinos are a growing segment of the population and will undoubtedly be an important stakeholder in the future of natural resource management (Chapter I). While changes in Latino demographics may be minor in some states, other states are expected to see significant changes in the next 40 years. Understanding Latino knowledge and attitudes toward natural resources is essential because it provides natural resource agencies with the necessary tool (population specific knowledge) that can be used to achieve their goals of protecting and managing natural resources (Chapter I). Failure to understand differences in stakeholder culture (i.e., values, attitudes, and behavior) will limit public outreach programs and partnerships with agency constituents, and ultimately the management of natural resources (Harris 1985, Duda and Brown 1999, Decker et al. 2001).

The Latino population represents a unique group shaped by similar cultural characteristics, which may include language and religion, yet vastly different geopolitical experiences (Chapter I). Many of the more obvious similarities are an artifact of socioeconomic conditions, which include high poverty rates, low levels of educational attainment, low-wage employment and high employment rates, and social conditions that include exposure to racism and political powerlessness. Furthermore, these within-group differences are complicated by varying levels of acculturation and generation. Acculturation is a social process of “culture learning and behavioral adaptation....[in] any or all of six areas of psychological functioning: language use, cognitive style, personality, identity, attitudes, and stress” (Marín and Marín 1991:36).

With immigration, the cycle of acculturation and generation begins anew for every individual who migrates to a different country, thus producing a “revolving door” of individuals of the same national group with varying levels of acculturation and generation, which influence their attitudes and perspectives. Because the Latino community is comprised of several such groups, a general template outlining typical Latino cultural characteristics would be ideal; however, impossible because the differences within the Latino culture negate such a monolithic ideal (Chapter I).

Understanding the Latino culture can be useful to wildlife agencies in accomplishing their conservation mission; however, this understanding is challenged by the complexity of the Latino culture and the lack of agency experience with these underserved populations (Chapter I). A limited number of studies (Caro and Ewert 1995, Hunter 2000, Pfeffer and Stycos 2002) consider acculturation influences in Latino attitudes towards natural resource and the environment. Furthermore, due to the importance of acculturation processes in Latino experiences and attitude formation (Cuéllar et al. 1995, Cuéllar et al. 1997), further research is needed to evaluate its impact on Latino attitudes toward natural resources and the environment. Thus, the objectives of my study are to: (1) identify research findings that focus on Latino attitudes toward natural resources and the environment, and (2) synthesize these research findings and provide a more concise overview of the Latino community and natural resources, while incorporating acculturation and generational influences on attitudes toward the environment and natural resources.

Methods

In 2004, I conducted a literature search that focused on Latinos, natural resources, attitudes, and natural environment using 25 library databases that could be accessed under the Wildlife, Fisheries, and Aquatic Sciences category at Texas A&M University in College Station, Texas (Table 2.1).

Table 2.1. List of databases ($n = 25$) used in study, 2004.

Database name	
Academic Search Premier	Government Periodicals Index
AGRICOLA – [WebSpirs]	GrayLit Network
AGRICOLA (NAL)	Omni File Full Text Mega
AGRIS	Papers First (FirstSearch)
ArticleFirst (FirstSearch)	Proceedings First (FirstSearch)
Biological and Agricultural Index	Science Citation Index
CAB Abstracts	Science Direct
Conference Papers Index	Ulrich’s Periodicals Directory
CRC Press	Web of Science
Current Contents Connect	Wildlife and Ecology Studies
Digital Dissertations	Worldwide
EIS: Digests of Environmental	WorldCat (FirstSearch)
Impact Statements	Zoological Record – [WebSpirs]
GeoBase – [WebSpirs]	

For each of these databases, I queried 29 keyword combinations (Table 2.2). Articles that focused on general Latino topics, specifically those related to attitudes toward natural resources and the environment were retrieved and reviewed. Whenever possible, articles were reviewed with specific application and interest given to the Latino community of Mexican descent (largest Latino subgroup, Chapter I). General commonalities between articles were then synthesized.

After conducting the literature search, I divided relevant articles into 4 categories based on their participants and study focus. The first category, *U.S. Latinos in general*, consisted of articles that discussed U.S. Latinos and other ethnic groups in general. The second category, *general environmental attitude survey with Latinos in sample*, consisted of studies with general surveys on environmental attitudes that included Latinos in their samples. The third category, *immigrant environmental attitudes and behavior*, consisted of studies that compared environmental attitudes and behavior between foreign-born and native-born residents. Finally, the fourth category, *Latinos, acculturation, and environmental attitudes*, consisted of studies that considered acculturation influences on Latino environmental attitudes (Table 2.3). From these categories, I determined similarities and common themes among study findings.

Results

Over 800 articles related to Latinos, attitudes, natural resources, and natural environment were retrieved using various keyword combinations; however, only 17 of the 800 articles were relevant to my topic, Latino attitudes toward the environment and natural resources. Of the 17 relevant articles, 4 focused on the U.S. Latino community in

general (Farmer 1993, Lynch 1993, Farmer 1994, McAvoy et al. 2000, and Schelhas 2002), 7 focused on general environmental surveys that included Latinos in their samples (Bradley et al. 1997, Earle 1998, Earth Island Institute 1998, Klineberg 1998, Klineberg et al. 1998, Whitley 1999, Flannery 2001), 2 focused on immigrant

Table 2.2. Keyword combinations (separated by comma) used ($n = 29$) in study, 2004.

Keyword combinations	
Natural Resources, Latino	Cultural, Natural Environment, Hispanic
Natural Resources, Hispano	Cultural, Natural Environment, Mexican American
Natural Resources, Hispanic	Natural Environment, Latino
Natural Resources, Mexican American	Natural Environment, Hispano
Attitudes, Natural Resources, Latino	Natural Environment, Hispanic
Attitudes, Natural Resources, Hispano	Values, Natural Resources, Latino
Attitudes, Natural Resources, Hispanic	Values, Natural Resources, Hispano
Attitudes, Natural Resources, Mexican American	Values, Natural Resources, Hispanic
Attitudes, Natural Environment, Latino	Values, Natural Resources, Mexican American
Attitudes, Natural Environment, Hispano	Values, Natural Environment, Latino
Attitudes, Natural Environment, Hispanic	Values, Natural Environment, Hispano
Attitudes, Natural Environment, Mexican American	Values, Natural Environment, Hispanic
Cultural, Natural Environment, Latino	Values, Natural Environment, Mexican American
Cultural, Natural Environment, Hispano	Ethnicity, Natural Environment

environmental attitudes and behaviors (Hunter 2000 and Johnson et al. 2004), and 4 focused specifically on Latino environmental attitudes and acculturation (Noe and Snow 1990, Caro and Ewert 1995, Schultz et al. 2000, Pfeffer and Stycos 2002, Johnson et al. 2004, Tables 2.3 and 2.4). Of the relevant studies, few focused exclusively on the Latino community (e.g., Noe and Snow 1990, Caro and Ewert 1995, Schultz et al. 2000). Similarly, a limited number of studies ($n = 5$) incorporated key cultural characteristics of the Latino population, namely acculturation, assimilation and/or generation.

Table 2.3. Literature search results ($n = 17$) by content categories, 2005.

<p><i>U.S. Latinos in general</i></p> <ol style="list-style-type: none"> 1. Farmer 1993 2. Lynch 1993 3. Farmer 1994 4. McAvoy et al. 2000 5. Schelhas 2002 	<p><i>General environmental attitude survey with Latinos in sample</i></p> <ol style="list-style-type: none"> 1. Bradley et al. 1997 2. Earle 1998 3. Earth Island Institute 1998 4. Klineberg 1998 5. Klineberg et al. 1998 6. Whitley 1999 7. Flannery 2001
<p><i>Immigrant environmental attitudes and behavior</i></p> <ol style="list-style-type: none"> 1. Hunter 2000 2. Johnson et al. 2004 	<p><i>Latinos, acculturation, and environmental attitudes</i></p> <ol style="list-style-type: none"> 1. Noe and Snow 1990^a 2. Caro and Ewert 1995^a 3. Schultz et al. 2000^b 4. Pfeffer and Stycos 2002^b

^aThese articles represent studies conducted in the recreation fields. They were included in this category and study because they are commonly cited by the wildlife and natural resources fields.

^bThese articles examined foreign-born Latinos; however, because they considered acculturation, they were included in this category.

Table 2.4. Summary of literature, 2005.

Author	Main theme	Sample description	Language, acculturation, and generation measures
Noe and Snow 1990	Latino environmental attitudes and acculturation.	Study 1: $n = 874$, male and female Study 2: $n = 805$, male and female Primarily Cuban American.	Spanish and English. None.
Farmer 1993	Population growth impacts on wildlife in Rio Grande Valley and poverty.	Provides overview of population growth impacts and human consumption. Audubon's Sharing the Earth Program. North American Free Trade Agreement.	Not Applicable.
Lynch 1993	Latino environmentalism and culture.	Need for "sociological tools" in Latino research and environmental discourse. Latino environmental discourse and perspectives differ from mainstream. Latino environmentalism influenced by unique history. Latino environmentalism and environmental discourse defined by Latino culture.	Not applicable.
Farmer 1994	Population growth, poverty, and wildlife in the Rio Grande Valley	Addresses outreach programs. Environmental awareness among elite excludes majority of Latinos. Enlarge and diversify programs. $n = 398$ male and female $n = 39$ U.S.-born non-Latino white $n = 79$ U.S.-born Latino $n = 173$ Mexican-born Latino $n = 43$ Central American-born Latino	Not applicable.
Caro and Ewert 1995	Acculturation and its influence on Latino environmental attitudes.		Spanish and English. Place of birth, years living in U.S., and arrival age

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Caro and Ewert 1995	Acculturation and its influence on Latino environmental attitudes.		Spanish and English. Place of birth, years living in U.S., and arrival age

Table 2.4. Continued.

Author	Main Theme	Sample Description	Language, Acculturation, and Generation Measures
Whitley 1999	Marine wildlife attitudes.	<i>n</i> = 253 male and female 23.7% foreign-born 48% non-Latino white 41.9% minority group	English. Language, nativity, length of residence.
Hunter 2000	Environmental attitudes of foreign-born and native-born U.S. residents	<i>n</i> = 1,606 male and female >18 yrs of age <i>n</i> = 1,433 native-born residents <i>n</i> = 110 foreign-born residents	English. Residence at age 16.
McAvoy et al. 2000	Methodologies for conducting research with communities of color.	Review of natural resource literature and minority populations: African American, Native American, and Latinos.	Not applicable.
Schultz et al. 2000	Acculturation and environmental attitudes of foreign-born Latinos.	<i>n</i> = 153 male and female Foreign-born Latinos and ESL students.	Spanish and English. English proficiency.
Flannery 2001	Knowledge and attitudes toward wildlife between ethnic groups and community size.	<i>n</i> = 1,315 male and female <i>n</i> = 124 Latino <i>n</i> = 751 non-Latino white <i>n</i> = 440 African-American 5 th grade students	English. None.

Table 24. Continued.

Author	Main Theme	Sample Description	Language, Acculturation, and Generation Measures
Pfeffer and Stycos 2002	Environmental attitudes and behaviors of foreign-born and native-born residents.	<i>n</i> = 1,300 male and female Asian, African American, Latino, and non-Latino white.	English. Years of U.S. residence.
Schelhas 2002	Natural resource and environmental issues by ethnicity.	In-depth literature review. Role of race and ethnicity. Natural resource and environmental discrimination.	Not applicable.
Johnson 2004	“Ethnic variation in environmental belief and behavior”.	<i>n</i> = 3,513 males and females <i>n</i> = 248 African Americans <i>n</i> = 57 Asian Americans <i>n</i> = 169 U.S.-born Latinos <i>n</i> = 44 Foreign-born Latinos <i>n</i> = 2,995 non-Latino whites	Language not mentioned; assume English only. Not clear; assume immigrant status or country of origin.

As illustrated in Table 2.3, the first category, *U.S. Latinos in general*, consisted of 5 studies (Farmer 1993, Lynch 1993, Farmer 1994, McAvoy et al. 2000, Schelhas 2002). The article by Farmer (1993) discussed Audubon's Sabal Palm Grove Sanctuary in the Lower Rio Grande Valley and its participation in the *Sharing the Earth* Program and the role the North American Free Trade Agreement (NAFTA) is having on wildlife in this region. The author recommends refuge managers engage different cultures to improve resources and empower communities. Lynch (1993) discussed Latino environmental discourse and contrasted it with mainstream environmentalism using Latino literary works to describe the ideal Latino environment. She reports that Latino cultural and environmental ideals appear different from the mainstream (non-Latino white, middle-class values); however, Latinos value the environment to the same degree as non-Latino whites. This disjunction occurs in the interpretations and meanings attributed to Latino cultural practices toward the environment by those outside the culture. Literary examples are provided to illustrate differing perspectives between the Latino community and non-Latino whites. Hence, in order to engage the Latino community, solutions to environmental issues would be met with greater enthusiasm and approval if the solutions were in line with the particular Latino community's environmental and cultural ideals (Lynch 1993). In another article, Farmer (1994) described successful outreach efforts with the south Texas Latino community and offered recommendations to improve outreach efforts with Latino and impoverished communities. She suggested that outreach programs should be open to change, broad, inclusive, and considerate of community needs and interests. McAvoy et al. (2000)

provided a literature review on natural resources with a focus on minority populations, namely Latinos, African Americans, and Native Americans. They discussed the complexity of working with underrepresented groups and offered suggestions to improve future research with minority groups. Finally, Schelhas (2002) discussed a literature review of race, ethnicity, and natural resources, including natural resource and environmental discrimination, and the need to provide more ethnically inclusive strategies to better preserve natural resources and the environment. Collectively, the studies in this category provided general Latino and ethnic group historical accounts within the natural resource and environment fields. None of the studies, however, considered acculturation and generation as potential influences on Latino environmental and natural resource attitude formation; the emphasis of these studies was to provide an overview of ethnic group information and strategies to improve future research and public outreach programs.

The second group of studies, *General environmental attitude surveys with Latinos in sample*, consisted of 7 studies (Bradley 1997, Earle 1998, Earth Island Institute 1998, Klineberg 1998, Klineberg et al. 1998, Whitley 1999, and Flannery 2001). Bradley (1997) discussed the influence of an environmental education course on environmental attitudes, measured by English language pre- and post-tests. His sample consisted of Texas high school students where Latinos were part of the sample. Bradley (1997) concluded that although the students harbored environmentally favorable attitudes before the study, the course did favorably influence environmental attitudes. Females and upper grade level students were more environmentally friendly than males

and lower grade level students. The sample-size of African American and Native American participants was too small to draw significant conclusions about these 2 groups. Bradley (1997) reports external factors such as teacher attitude, life experiences, socio-economic status, and culture could have influenced the results; however, these variables were not considered in the study's research design.

Earle (1998) discussed the role of socio-cultural factors on attitudes toward natural resources and resource development. The study population consisted of San Luis Valley, Colorado residents, approximately 22 were of Latino-descent. All surveys were conducted in English. Participant views and attitudes toward forests, logging, water issues, pollution, wildlife, wildlife refuges, poaching, endangered species, minerals and mining, oil and gas, natural resource administration, agricultural and public land uses were presented (Earle 1998). Earle (1998) reports attitudes toward natural resources result from many different factors, part of which may be influenced by parental attitudes as well as cultural factors. She found it difficult to measure and attribute attitudes specifically to any one particular socio-cultural factor, and did not find ethnic differences "... regarding attitudes toward natural resources". Instead [her research] indicates that such attitudes may be pan-cultural, not differing solely with ethnicity, but strongly influenced by family heritage, education, length of residence, gender and income" (Earle 1998:129). The study found that in general, but not exclusively, respondents who were closer to an event or lived longer in the area held stronger attitudes, values and/or higher response rates than respondents who were not as close to an event. Variation of responses and their conflicting nature made it difficult to draw specific and concrete

conclusions about how socio-cultural factors affect attitudes toward natural resources. Because of the study's breadth, she concluded it was difficult to capture specific Latino attitudes toward natural resources.

Earth Island Institute (1998) provided general environmental attitude results from a Roper Center for Public Opinion Research survey. Specifics about survey year, methods, language, and summary of socio-cultural factors considered were not provided in the article. The study did conclude, however, that African Americans and Latinos had more pro-environmental attitudes than non-Latino whites. This result was attributed to Latino and African American proximity to "environmental destruction" areas. It is assumed that acculturation and generational influences were not considered in this survey.

The article by Klineberg (1998) compared environmental attitudes of Texas Houston-area Latinos, African Americans, and non-Latino whites to determine how race and ethnicity affected environmental concern when demographic and political variables were controlled. Klineberg (1998) reported that Latinos, African Americans, and non-Latino whites shared similar environmental concerns when questions were phrased in terms of the seriousness of pollution and pro-environmental participation. General group attitudinal differences were insignificant, except when environmental tradeoffs involved "higher taxes, slower economic growth, increased joblessness, or worsening income inequalities" (Klineberg 1998:81). The study used both English and Spanish language surveys. This study is important for determining environmental attitudes of

Texas residents and should be expanded to include present demographic changes in Texas as well as cultural factors specific to Texas Latinos.

The article by Klineberg et al. (1998) examined survey questions from the Texas Biennial Environmental Survey used to measure environmental concerns of Texas residents during 4 survey periods and assessed whether the survey yielded predictable results based on demographic variables. Four categories of environmental concern were measured in the study: (1) economic versus environmental tradeoffs, (2) pollution, (3) pro-environmental behaviors, and (4) ecological worldview (Klineberg et al. 1998). Klineberg et al. (1998) argues that wording and phrasing of survey questions, such as mentioning the seriousness of pollution, yield predictable results for many demographic variables, such as education, age, religiosity, income, rural versus urban residence, gender, political orientation, and ethnicity. According to Klineberg et al. (1998), younger, more educated individuals show higher levels of environmental concern, quality and protection. Participants' political orientation and rural versus urban residence were related to government intervention and the proximity of pollution to the participants, respectively. Income level was associated with willingness to support and participate in environmental initiatives. Both African American and Latino participants favored increased government environmental protection interventions; however, when economic costs were associated with environmental issues, they were less willing to accept economic tradeoffs. Women participants favored regulatory environmental measures over economic tradeoffs and participated in "green" shopping. Participants

who hold non-fundamentalist religious beliefs were more likely to participate in recycling programs and in “green” shopping.

The article by Whitley (1999) determined marine wildlife attitudes of Los Angeles museum attendees to explore cross-cultural conflicts resulting from differing attitudes. The study included Latinos in its sample. Whitley (1999) provides a literature review of sociological and anthropological theories and research dealing with attitudes toward animals, attitude formation, value systems, race, ethnicity, culture, assimilation, acculturation, and related issues. According to Whitley (1999), attitudes toward marine wildlife are formed from a combination of: culture, income, and education; furthermore, the study indicates, positive relationships exist between “knowledge of, interactions with, and preferences for marine wildlife.” (Whitley 1999:216). Whitley (1999) reports that a person’s attitude towards animals is influenced by their culture; therefore, if certain cultural practices and perspectives contradict those of another culture, such as Latinos and the mainstream American culture, conflicts between these 2 groups may occur. In this study, Latinos and African-Americans, had achieved lower levels of education, had lower incomes, and favored utilitarian and negativistic attitudes toward animals. Although the study participants were culturally diverse, they were museum attendees who by that very nature may value marine wildlife and animals more than non-participants and who had the economic means to attend the museum. Acculturation was measured by language, nativity, and length of residence (Whitley 1999). Hispanics in this study were “...less tolerant of practices that harmed animals and the environment.” (Whitley 1999:219)

Finally, Flannery (2001) compared east Texas elementary students' knowledge and attitudes toward wildlife between different ethnic groups and by community size. Fifth grade students were surveyed and Latinos were part of the sample. According to this study, television was the primary source of wildlife information for students. Participation in hunting activities was greater for non-Latino white students than African American or Latino students. Fishing was common for all ethnic groups regardless of community size. African American and Latino students had lower attitude scores toward wildlife than non-Latino whites. Positive correlations between wildlife activity participation and attitudes toward wildlife were observed (Flannery 2001). The study suggests that wildlife-related exposure at a young age may influence participation and attitudes toward wildlife-related activities. In summary, these studies acknowledge an underlying cultural construct (e.g., acculturation and generation) that influences Latino attitudes toward the environment and natural resources; however, standard measurements of these cultural factors were lacking.

The third category of studies, *Immigrant environmental attitudes and behavior*, consisted of 2 studies (Hunter 2000, Johnson et al. 2004) that focused on native and foreign-born immigrants throughout the U.S. (Table 2.3). The first article by Hunter (2000) compared environmental attitudes, concerns, and behaviors of foreign-born and native-born U.S. residents. The study used data from the 1993 General Social Survey and compares short-term immigrants with longer-term immigrants. According to this study, short-term residents demonstrated more concern for "environmental dangers posed by pesticides, pollution, and the greenhouse effect" (Hunter 2000:576), made

more environmentally friendly behavioral adjustments, and were more likely to sign environmental petitions. Hunter's (2000) findings suggest that long-term residents' attitudes, concerns, and behaviors are more like the mainstream American public than short-term residents. The author attributes these results to assimilation processes. The study is timely in attempting to determine attitudes, concern, and behaviors of 2 categories of foreign-born residents and comparing these to native-born U.S. residents. The research design, general concepts, and methods are useful for other researchers; however, there are 2 flaws in the study. First, only English language surveys were used to determine foreign-born residents' attitudes, concerns, and behaviors. Second, some of the survey questions were not culturally sensitive to immigrant populations, especially short-term residents. For example, questions regarding the willingness to purchase organic products may be inappropriate for 2 reasons. The concept may be unknown to recent immigrants and the relative cost of organically grown products is more expensive. Hence, the survey may be confounding "attitudes" with socioeconomic status. In other words, the attitudes may not reflect an immigrant culture, but rather the attitudes may reflect the participants' economic status.

In the article by Johnson et al. (2004), environmental values and behavior between different ethnic groups and non-Latino whites were compared using data from the National Survey on Recreation and Environment (NSRE, Versions 2 and 4) and the New Ecological Paradigm (NEcP, Dunlap et al. 2000). The authors postulated that if a given ethnic group scored higher on the NEcP (i.e., more environmentally friendly), then they would engage in more environmental activities/environmentally friendly behaviors,

as measured by the NSRE. This study's findings suggest that U.S.-born Latino environmental attitudes and behaviors were most similar to non-Latino whites. Johnson et al. (2004:178) recommends the use of "immigrant status, acculturation level, language, or country of origin" to distinguish between Latino groups (e.g., U.S.-born Latinos versus foreign-born Latinos). Further, they report differences between U.S.-born and foreign-born Latino environmental attitudes and behaviors; however, it was not clear how acculturation was measured. Given the results of these 2 articles, it appears that immigrant environmental attitudes and behaviors differ between U.S.-born and foreign-born Latinos. The root of these differences may involve cultural factors, such as acculturation.

The fourth category, *Latinos, acculturation, and environmental attitudes*, consisted of 4 studies that focused on Latinos and acculturation influences on environmental attitudes (Noe and Snow 1990, Caro and Ewert 1995, Schultz et al. 2000, Pfeffer and Stycos 2002, Table 2.3). Caro and Ewert (1995) attempted to determine the effect of acculturation level (measured by length of residence in the U.S. and the arrival age of the individual) on the environmental attitudes of visitors in 2 California forests. Caro and Ewert (1995) hypothesized that (1) the closer an individual's place of birth is to the U.S., the more similar his or her concern about environmental problems will be to those of 'Anglos', and (2) arrival age will be a better predictor of environmental concern than individual age. The authors used Spanish and English language questionnaires to survey the target population. Demographic information, which included place of birth, years in the U.S. and arrival age, was obtained. According to Caro and Ewert (1995),

place of birth and years in the U.S. influenced environmental attitudes. The longer participants lived in the U.S., the more similar their environmental attitudes were to mainstream American values. Arrival age also influenced the environmental attitudes of participants, specifically, on some items, older Hispanic immigrants scored lower on the environmental attitude scale. The authors state this was an exploratory study; as such, there were 3 flaws in the research study design. First, sampling bias exists since only park visitors, who may already harbor more environmentally friendly attitudes, were surveyed. Second, socioeconomic status and access to transportation may be confounding “attitudes” with “ability to” visit parks. Finally, measuring participant acculturation level based on age of arrival, years in the U.S., and the proximity of a participants’ native land to the U.S. is misleading. The process of acculturation is far more complex. It considers cultural constructs, such as familism and personalismo (Cuéllar et al. 1995) that are not only difficult to measure but also over-generalized and misinterpreted by the mainstream American culture (e.g., machismo).

Noe and Snow (1990) measured environmental attitudes of 2 south Florida Latino populations. Noe and Snow (1990) used the New Environmental Paradigm to survey the south Florida population (in general), and boaters and park visitors (specifically). In the boaters and park visitors study, intercept surveys were used on Biscayne Bay boaters and park users. An additional mail survey of Dade County, Florida registered boaters, who were primarily male, also were conducted. In surveying the general south Florida population, random telephone surveys were used to collect data. In comparing study results between both studies, they found that both Latino and

non-Latino participants in the boaters and park visitors survey had median pre-tax household income and education level above the national average. Latino participants in the boater and park visitors study favored a “more ecological model and ... preservation ethic” (Noe and Snow 1990:31) similar to non-Latinos. In the general south Florida population study, the majority of respondents were female and income and education levels were lower (Noe and Snow 1990). Latinos in the south Florida population study were not boaters nor park visitors, neither were they in favor of “‘mankind’ dominating the environment” (Noe and Snow 1990:30). Noe and Snow (1990) concluded that being exposed to and interacting with the outdoor environment may affect Latino attitudes toward the environment. The authors also report that sociocultural factors may play a role in Latino environmental attitudes, including acculturation; however, they did not measure acculturation and suggested future research could address this factor. Applying the New Environmental Paradigm scale to determine Latino environmental attitudes is timely, especially in south Florida, where there is a growing Latino population. Nonetheless, to generalize the results of this study to the Latino population in the U.S. is erroneous, since the south Florida population is primarily composed of Cuban Americans, who are roughly less than 5% of the U.S. Latino population (Chapter I) Furthermore, Cuban Americans are the Latino subgroup that most resemble the non-Latino whites’ socio-demographic profile. In other words, Cuban Americans are closer to non-Latino whites than to Latinos in general.

The article by Schultz et al. (2000) hypothesized that as foreign-born Latinos became acculturated, they would adopt the mainstream environmental views of native-

born residents. Schultz et al. (2000) surveyed foreign-born Latinos enrolled in an adult education program (i.e., English as a Second Language [ESL]) at a California high school. The ESL program was divided into 3 levels, I, II, III, and the 3 levels were surveyed simultaneously. For comparison purposes, predominantly non-Latino students enrolled in an adult education Spanish course (i.e., did not speak Spanish) at the same high school were surveyed. Surveys were available in Spanish and English, and included an acculturation scale, environmental attitude scale, a demographic section, as well as an environmental behavior section (Schultz et al. 2000). The study found that foreign-born Latinos enrolled in the ESL classes were younger, less educated, and had lower incomes compared to those enrolled in the Spanish class. Both groups were primarily female. The foreign-born Latino group consisted of students from Mexico, Central America, and South America. Schultz et al. (2000) found that as the ESL class level progressed from Level I to Level III, the students scored higher on the acculturation scale. Comparisons between ESL class levels and environmental attitudes resulted in higher scores on the New Environmental Paradigm scale for lower-level ESL students (less English proficient) versus higher-level ESL students. Native-born residents scored lower on the New Environmental Paradigm scale as compared to foreign-born Latinos. Foreign-born Latinos who participated in the study had lived in the U.S. an average of 6 years. In their study, the authors found no relationship between number of years living in the U.S. and acculturation (Schultz et al. 2000).

The final study in this group was by Pfeffer and Stycos (2002). This study focused on immigrant and native-born residents' environmental behaviors in New York

City. Pfeffer and Stycos (2002) found that conservation behaviors were common among immigrants; however, political participation was less common when compared to native-born residents. This study suggests that decreased political activity among immigrants may stifle "...efforts to build a more inclusive and diverse environmental movement" (Pfeffer and Stycos 2002:78). Furthermore, the authors suggests that fear of immigrants not engaging in environmentally friendly behavior and "environmental degradation" is unfounded, since in some issues, such as water conservation, immigrants were more likely to conserve resources when compared to native-born residents. Another finding suggests that environmental concern among immigrants was not lower than native-born residents' environmental concern. In summary, this group of 4 articles suggests that cultural factors influence environmental concern. The most common cultural factor identified among this group of articles is acculturation, which influences both foreign- and native-born residents.

Discussion

This literature review indicates that culturally relevant literature on Latinos and natural resources is lacking. In general, Latino attitudes toward natural resources and the environment were on average quite similar to non-Latino whites. Some differences were attributed to cultural factors, which included acculturation and generation. Of the 17 relevant articles on Latino attitudes and/or concerns, few mentioned acculturation, and when acculturation was assessed, one or more of the following measures of acculturation and/or generation were used: (1) length of U.S. residence (e.g., Caro and Ewert 1995, Hunter 2000, Pfeffer and Stycos 2002), (2) language proficiency (e.g., Schultz et al.

2000), and (3) arrival age (e.g., Caro and Ewert 1995, Table 2.3). These studies determined that acculturation influenced environmental attitude formation, but clear descriptions of the relationship between acculturation and attitudes were not explained or determined. A few shortcomings were present in some of the relevant studies: (1) failing to offer the measurement instrument in a participant's native language, particularly when trying to determine the attitudes of immigrant populations, (2) generalizing results from one subpopulation to the entire Latino community, (3) measuring only English-speaking immigrants' attitudes and generalizing to the immigrant community, (4) measuring acculturation solely based on language proficiency, years of U.S. residence, age at U.S. arrival, or proximity of one's native country to the U.S., (5) failing to incorporate representative samples into study designs, (6) using limited-access study sites or activities that depend more on socioeconomic factors rather than on the attitudes one is purportedly measuring, and (7) failing to incorporate relevant cultural and demographic variables into the study's research design.

In my literature review, I found few natural resource studies have adequately considered Latino cultural influences on environmental concern and even fewer have exclusively focused on the Latino community; hence, a limited amount of information is available on Latino attitudes toward natural resources and the environment. This lack of information has serious programmatic implications for the management and allocation of natural resources in the United States (Chapter I). Nonetheless, previous study findings do have merit in increasing our understanding of the Latino community and in directing future attitudinal research. Two areas for improvement are: (1) incorporating the

Latino's unique sociocultural characteristics into future attitudinal research, and (2) engaging this emerging stakeholder with the development of programs that are culturally sensitive and accessible.

Latino attitudes are linked, in part, to their historical and political life experiences (Chapter I); thus, if the Latino has not achieved equal status with the non-Latino white, then a comparison between these 2 groups is not feasible because they have completely different economic, cultural, political, and historical starting points and ultimately perspectives (Chapter I). From my literature review, it is clear that Latinos hold different environmental perspectives from non-Latino whites when socioeconomic factors and environmental behaviors are involved (Klineberg 1998, Johnson 2004); however, overlooked is the fact that previous studies indicate that Latinos value conservation and natural resources at a minimum to the same degree as non-Latino whites (Klineberg 1998, Johnson 2004). So the question then becomes are Latinos as environmentally concerned as non-Latino whites? According to the above literature review, the answer is "Yes." Latinos are environmentally aware and concerned about the environment to the same degree if not more than non-Latino whites; however, due to varying socioeconomic (e.g., high employment rates, yet paid lower salary, Chapter I) and sociocultural (e.g., racism, discrimination, and environmental injustices) influences, their behaviors and concerns focus on different issues than non-Latino whites. In essence, the existing difference between Latinos and non-Latino whites is influenced by opposing cultural perspectives on environmental ideals brought about by social differences in these 2 groups (Lynch 1993). So, when considering cultural, political,

historical, and socioeconomic differences between Latinos and non-Latino whites (Chapter I), it is clear that holding Latinos to non-Latino white middle-class values offers no solutions. Natural resource agencies must look beyond comparing Latinos to non-Latino whites. Instead, a focus should be placed on the target population, for instance, the south Texas Latino community or the northern New Mexico Hispanos. When differences between Latinos and non-Latino whites are acknowledged and when cultural, socioeconomic, and ethnic differences are better understood, natural resource managers will make greater strides toward engaging the emerging Latino stakeholder. Future research should focus on (1) bridging the present knowledge gap and, (2) developing culturally sensitive programs and reciprocal partnerships with the Latino stakeholder.

My literature review illustrates the limited use of acculturation in natural resource attitudinal research. The Latino community's cultural, regional, language, and social characteristics influence their attitudes and perspectives; hence, it warrants that natural resource managers consider these factors in program development and implementation. The purpose of measuring acculturation is to determine where on the bicultural or assimilation continuum a particular group stands. Given that culture influences attitudes (Cuéllar et al. 1997), the attitudes of less acculturated individuals will differ from those of highly acculturated or assimilated individuals. In reality, natural resource agencies often face a very complex Latino community where foreign-born Latino immigrants continually blend into an already established Latino group where segments of the population have progressed from first to second generation, thus

producing a “revolving door” effect. Measuring acculturation adequately then becomes critical to natural resource managers. By avoiding generalizations about the level of acculturation (see results), natural resource management agencies will form meaningful and reciprocal partnerships with the target Latino community.

Management Implications

The implications of my study findings are two-fold. First, if the present trend continues, the disenfranchised segment of the U.S. population will continue to grow – at the same time, we will have limited information to determine Latino preferences toward natural resources, which will undermine our management and conservation efforts. Second, it will be difficult for natural resource programs to gain support from emerging stakeholders if they are not engaged in the process of planning and implementation. To do this, natural resource managers need to increase their knowledge regarding Latino attitudes toward natural resources and the environment, and more specifically, natural resource managers need to further explore the influence of acculturation and generation on Latino attitudes toward natural resources and the environment. Culture helps shape attitudes (Marín and Marín 1991). For U.S. Latinos, culture often means some degree of biculturalism; hence, acculturation, generation, and language use become important factors that should be incorporated into future Latino studies. Additionally, collaboration with other professions, who specialize in serving underrepresented groups is required. I recommend collaboration with social scientists, specifically those whose area of expertise involves race, gender, and ethnic group relations, attitude measurement, and those who serve and advocate for underrepresented populations.

CHAPTER III

TEXAS LATINO ATTITUDES TOWARD NATURAL RESOURCES AND THE ENVIRONMENT

Synopsis

Latinos in the United States (U.S.) are an increasing segment of the population and undoubtedly will be an important stakeholder in the future management of natural resources. Although Latinos have been included in attitudinal research on environmental concerns, a limited number of studies have exclusively focused on gaining information about this important stakeholder. I surveyed Texas college and university students of Mexican descent ($n = 635$) to determine the level or degree of environmental concern for this segment of the population. I determined a Latino Environmental Concern scale (LEC) for each respondent and compared this index to several demographic variables. I found 6 variables had predictive value for LEC among Latinos: gender, religiosity, political candidate's environmental position, mother's education, combined parent income, and number of grandparents born in the U.S.. I hypothesized that acculturation would be an important factor in predicting LEC; however, acculturation level was not significant, which may be attributed to small sample sizes (i.e., $n = 5$ for students with low acculturation scores). Future research in determining the importance of acculturation in forming Latino attitudes about natural resources and the environment is needed.

Introduction

Natural resource managers continually face challenges in managing public natural resources, particularly with emerging stakeholders. A fundamental problem for natural resource managers is recognizing and considering stakeholder interests in management and policy decision-making processes (Bromley 1991, Decker et al. 2001). Stakeholders ultimately will be affected by and will affect the future of natural resource management (Susskind and Cruikshank 1987, Decker et al. 2001). Understanding differences in stakeholder attitudes and knowledge is desired in the overall success and acceptance of management decisions made by wildlife agencies. Moreover, understanding stakeholder attitudes and knowledge are essential to successfully implement public outreach programs. Partnerships formed from these outreach programs will enhance the management of our natural resources and increase support for natural resource agencies and their mission (Harris 1985, Duda and Brown 1999, Decker et al. 2001).

Latinos in the U.S. are an increasing segment of the population and an important stakeholder in the future of natural resource management. Changes in Latino demographics will be minor in some states; however, other states are expected to see significant changes in the next 40 years. For example, Texas supports the second largest Latino community in the country. Latinos are expected to comprise nearly 60% of the Texas population by 2040, the majority of which are of Mexican descent (U.S. Census Bureau, Population Survey 2000, Murdock et al. 2003). Understanding Latino knowledge and attitudes towards natural resources is important because it will lead to the

success of natural resource agencies' and their efforts to protect and manage those resources (Chapters I-II).

Studies concerning environment and natural resource attitudes have been conducted in response to ecological and environmental changes as a means to identify and ameliorate specific concerns (Weigel and Weigel 1978). Today, the rapid growth of the Latino population in the U.S., specifically the Southwest, has become an important turning point in the history of environmental and natural resource attitude measurement. As previously mentioned, the influence Latinos will have on the allocation and management of natural resources in Texas could be significant (Chapter I). Many surveys have been developed to determine natural resource and environmental concerns in the U.S, namely, Environmental Concern (Weigel and Weigel 1978), New Ecological Paradigm [NEcP] (Dunlap et al. 2000), National Opinion Research Center-General Social Survey [GSS] (2003). Few, if any, of these studies have focused exclusively on Latinos in the U.S. (Noe and Snow 1990, Schultz et al. 2000), much less Texas (Texas Biennial Environmental Survey [TEBS] 1998, Chapter II). Thus, the objective of my study was to survey Texas Latinos and identify variables that influence environmental attitudes, knowledge, and concerns toward the environment and natural resources, while accounting for characteristics unique to this community, namely acculturation and generation. Such information can be used by natural resource agencies for program development and implementation and more specifically for programs that target this emerging stakeholder group.

Methods

Target population

I surveyed Texas Latino community college and university students from 7 institutions (Fig. 3.1). Community college and university students were selected for many reasons. First, they were selected in order to control for education, as an independent variable. Second, community colleges and universities were selected because of their high Latino student enrollment. Finally, these campuses were selected because they were located in areas with a predominately high Latino population; thus, my study sample was a purposive sample (Babbie 1990) since it focused exclusively on Latino attitudes toward natural resources and the environment.

Table 3.1. Texas Latino community colleges and universities (n=7) sampled, 2005.

Institution Name	Approximate	
	Number of Students	Location
Coastal Bend Community College	1,600	Alice
Coastal Bend Community College	1,300	Beeville
Coastal Bend Community College	2,500	Kingsville
El Centro Community College	7,000	Dallas
El Paso Community College	15,000	El Paso
University of Texas at Brownsville	10,000	Brownsville

Survey development

The index of environmental concern (hereafter the Latino Environmental Concern scale [LEC]) consisted of questions from 3 commonly used indices of environmental concern: General Social Survey (GSS 2003), New Ecological Paradigm (NEcP, Dunlap et al. 2000), and the Texas Biennial Environmental Survey [TBES], Klineberg 1998). From questions used in these surveys, I selected 15 questions based on their consistency across the 3 commonly used indices and their relevance to regional, cultural, language, and social characteristics of the target population (Table 3.2). Responses for the LEC were in Likert format, 1 through 5, with 1 representing “Strongly Agree,” 2 “Agree,” 3 “Neither Agree nor Disagree,” 4 “Disagree,” and 5 “Strongly Disagree.”

The variables included in my survey were divided into 3 categories (demographic, sociopolitical, and sociocultural). Demographic variables included in the survey were: (1) ethnicity (Latino, non-Latino; used to select a Latino only sample), (2) gender (male, female), (3) age (≤ 20 years, 21-30, 31-40, 41-50, ≥ 51 year), (4) religious preference (Catholic, Protestant, non-Christian, other), (5) religiosity (never, $<$ once a year, 1-2 year, several times/year, once a month, 2-3 times a month, nearly every week, every week, several times a year), (6) combined parent income ($\leq \$9,999$, \$10,000-24,999, \$25,000-49,999, \$50,000-74,999, \$75,000-109,999, $\geq \$110,000$), (7) father’s education level ($<$ high school; high school [diploma or equivalent]; $<$ college [with or without a high school diploma or equivalent, plus technical school completion and/or college attendance]; college [college degree]; and graduate [graduate or professional

Table 3.2. Latino Environmental Concern questions ($n = 15$; Likert format^a), 2005.

Questions	
1. We worry too much about the future of the environment and not enough about prices and jobs today.	9. When humans change the natural environment, it often produces disastrous results.
2. People worry too much about human progress harming the environment.	10. We are not harming the environment when we do normal things, like driving cars and running air conditioners.
3. There are more important things to do in life than protect the environment.	11. People worry too much about threats to the global environment.
4. Many of the claims about environmental threats are exaggerated.	12. Plants and animals exist primarily to be used by humans.
5. Too much emphasis these days on conserving resources, not enough on using them for current needs.	13. There is no point in doing what I can for the environment unless others do the same.
6. Humans do not need to adapt to the natural environment because they can change it to suit their needs.	14. It is too difficult for someone like me to do much about the environment.
7. We humans are approaching the limits of earth's room and resources.	15. I do what is right for the environment, even when it costs more money or takes up more time.
8. To help solve the earth's environmental problems, the U.S. and other rich countries will have to reduce	

^a 1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree

degree)], and (8) mother's education level (< high school; high school [diploma or equivalent]; < college [with or without a high school diploma or equivalent, plus technical school completion and/or college attendance]; college [college degree]; and graduate [graduate or professional degree]).

Sociopolitical variables in the survey were: (1) environmental identification (active environmentalist, sympathetic, neutral, unsympathetic, don't know), (2) political affiliation (Republican, Democrat, Independent, other), and (3) political candidate's position on environmental issues (very important, somewhat important, not very important). Sociocultural variables in the survey were: (1) generation (number of grandparents born in U.S.), and (2) acculturation level (Level I, very Mexican oriented; Level II, Mexican oriented to approximately balanced bicultural; Level III, slightly Anglo oriented, bicultural; Level IV, strongly Anglo oriented; and Level V, very assimilated, Anglicized). Acculturation level was determined using the Acculturation Rating scale for Mexican Americans-II (ARSMA-II) as prescribed by Cuéllar et al. (1995). The LEC survey was reviewed for face and content validity by Dr. Cruz C. Torres, and it was approved by Texas A&M University's Institutional Review Board, protocol number 2005-021.

Data collection

In spring 2005, I compiled electronic mail (e-mail) addresses for all faculty at each of the 7 institutions targeted for surveys. An e-mail message requesting assistance in conducting the surveys during regularly scheduled class times was sent. In the original design, I was to personally administer the surveys at each site; however, all faculty members ($n = 27$) that responded to the initial email contact and that agreed to participate chose to administer the surveys themselves. Each faculty member was sent instructions on how to conduct the survey, an informed consent form for each student

participant, along with the appropriate number of surveys, and a pre-paid return envelope.

Data analysis

I conducted a reliability analysis of the LEC using SPSS (Version 11.5, Chicago, Illinois, USA), and found the scale to be appropriate (Gall et al. 2003; Cronbach's Alpha = 0.687,). Next, I divided the respondents into Latino and non-Latino categories. Non-Latinos were not included in the calculations. I then calculated an LEC score for each Latino participant. I compared the level of environmental concern (LEC, determined by summation and reverse summation of each participant's response to 15 environmental concern questions) among Texas Latino students to 12 demographic variables using ordinal logistical regression in SPSS (Version 11.5, Chicago, Illinois, USA). Odds ratios for significant ($P < 0.05$) model variables also were calculated (Hosmer and Lemeshow 2000).

In addition to comparing the overall LEC index to demographic variables, I compared LEC values for each individual environmental concern question to the demographic variables. The purpose of this comparison was to determine patterns in predicting LEC by question type. Questions were categorized into 4 environmental issue categories: ecological catastrophe, environmental future, environmental participation, and human domination.

Results

Surveys collected

Surveys ($n = 1,353$) were mailed to 27 Texas community college and university professors who were willing to participate in the study. Of these, 7 professors did not return surveys, while 20 professors returned completed surveys ($n = 755$, final response rate 56%). Of the 755 surveys received, 16% ($n = 120$) were from non-Latino participants. The remaining surveys, 84% ($n = 635$), were from Latino participants. The results presented in this thesis are based on the analysis of these 635 Latino respondents (Table 3.3).

Table 3.3. Summary demographics for Latino respondents ($n=635$), 2005.

Model variable	%	Mean	SD
Age (yrs)		25.21	7.90
≤ 20	36	--	--
21-30	43	--	--
31-40	12	--	--
41-50	5	--	--
≥ 51	3	--	--
Gender		--	--
Male	31	--	--
Female	69	--	--

Table 3.3. Continued.

Model variable	%	Mean	SD
Classification		--	--
<i>Freshman</i>	25	--	--
<i>Sophomore</i>	39	--	--
<i>Junior</i>	21	--	--
<i>Senior</i>	12	--	--
<i>Other</i>	3	--	--
Combined parent income (\$) ^a		30,000	4,500
=9,999	14	--	--
10,000-24,999	29	--	--
25,000-49,999	30	--	--
50,000-74,999	14	--	--
75,000-109,999	9	--	--
=110,000	4	--	--
Political Affiliation		--	--
<i>Republican</i>	21	--	--
<i>Democrat</i>	48	--	--
<i>Independent</i>	23	--	--
<i>Other</i>	8	--	--

Table 3.3. Continued.

Model variable	%	Mean	SD
Religious Preference		--	--
<i>Catholic</i>	76	--	--
<i>Protestant</i>	17	--	--
<i>Non-Christian</i>	7	--	--

^a $n = 420$

Demographic predictors

Of the 12 independent variables tested for predicting LEC, using logistic ordinal regression, only 6 were important in predicting environmental concern among Texas Latinos ($P < 0.05$). These were gender, religiosity, political candidate's position on environmental issues, combined parent income, mother's education level, and generation (Table 3.4, Figure 3.1). However, the within group comparisons suggest 4 variables to be important predictors of LEC: gender, political candidate's position on environmental issues, mother education, and combined parent income. The results indicate that women are more environmentally aware (≈ 1.5 x odds) than men. Survey respondents that identified a political candidate's position on environmental issues as important had a greater environmental concern (≈ 1.5 - 2.5 x odds) than those who did not consider it to be important. I also found that as the students' parent's combined income increased, LEC values also increased (≈ 2.0 - 3.0 x odds). Finally, LEC values decreased with an increase in mother's education level (≈ 4.5 - 8.0 x odds). LEC score comparisons indicate gender,

environmental identification, candidate's position on environmental issues, and combined parent's income are significant at $P < 0.05$ for at least 1 question in each of the 4 environmental themes: ecological catastrophe, environmental future, environmental participation, and human domination (Table 3.5). These findings are similar to the regression results evaluating the overall LEC scores.

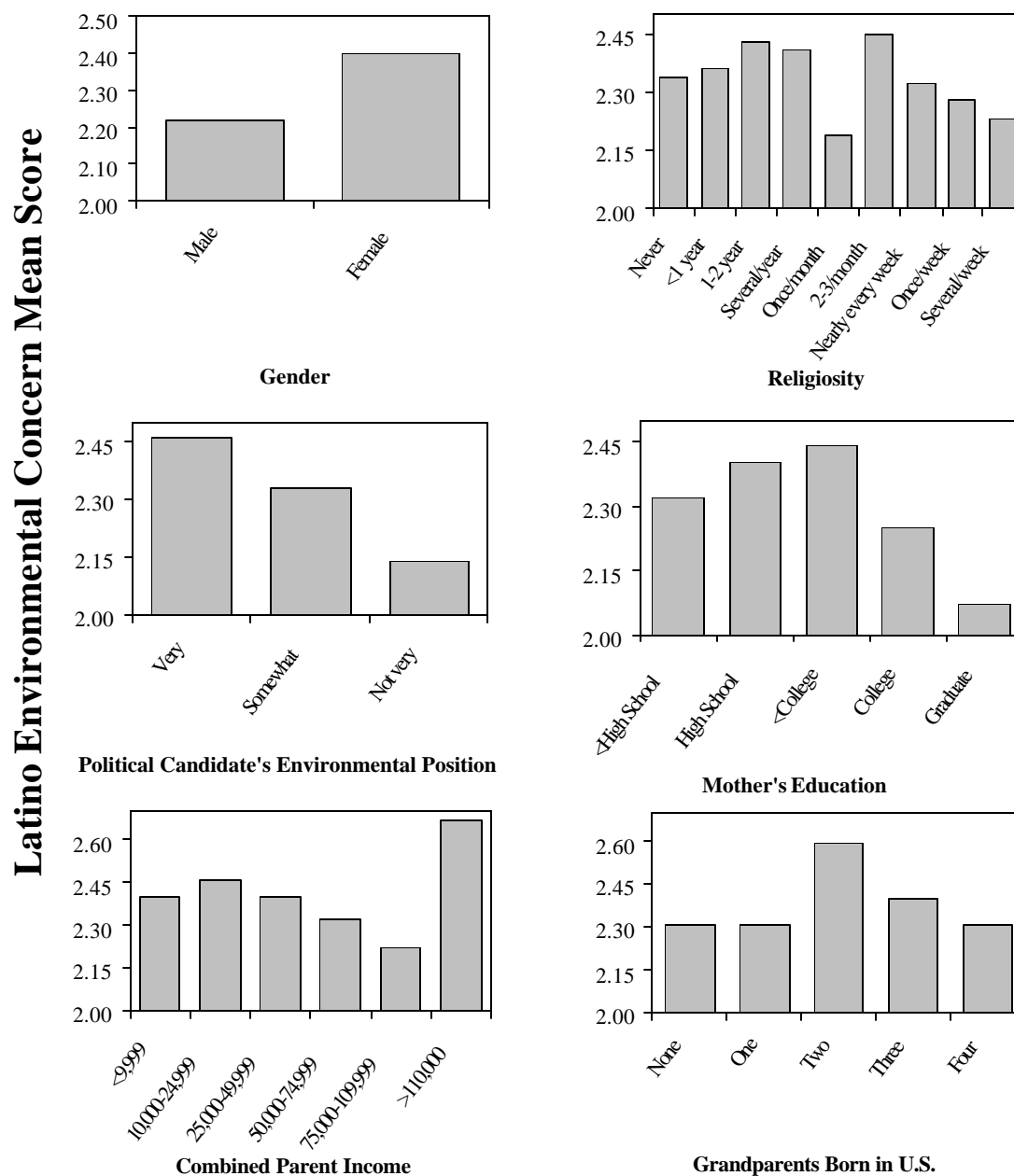
Table 3.4. Model parameter estimates, 2005.

Variable	β	P	Odds ratio	95% LCL	95% UCL
Gender					
<i>Female</i>	-0.400	0.011*	1.492	2.028	1.098
Religiosity					
<i>Never</i>	0.594	0.205	1.811	0.722	4.541
<i>Less than once a year</i>	0.248	0.553	1.282	0.564	2.913
<i>1-2 times a year</i>	0.765	0.049*	2.150	1.004	4.605
<i>Several times a year</i>	0.331	0.374	1.392	0.671	2.886
<i>Once a month</i>	0.229	0.572	1.257	0.568	2.782
<i>2-3 times a month</i>	0.605	0.143	1.831	0.815	4.114
<i>Nearly every week</i>	0.387	0.319	1.473	0.688	3.155
Environment Position					
<i>Very important</i>	0.931	<0.001*	2.536	1.634	3.937
<i>Somewhat important</i>	0.422	0.036*	1.525	1.027	2.265

Table 3.4. Continued.

Variable	β	P	Odds Ratio	95% LCL	95% UCL
Mother Education					
<i>Less than high school</i>	1.688	0.018*	5.409	1.334	21.925
<i>High school diploma</i>	1.895	0.008*	6.653	1.646	26.882
<i>Less than college degree</i>	2.088	0.004*	8.068	1.972	33.018
<i>College degree</i>	1.520	0.035*	4.571	1.110	18.827
Combined parent income					
<\$9,999	-0.767	0.053	2.154	4.683	0.991
\$10,000-24,999	-0.485	0.179	1.624	3.296	0.800
\$25,000-49,999	-0.698	0.045*	2.009	3.978	1.015
\$50,000-74,999	-0.618	0.097	1.856	3.849	0.895
\$75,000-109,999	-1.120	0.005*	3.064	6.697	1.402
Grandparents (born in U.S.)					
0	0.148	0.448	1.159	0.791	1.699
1	-0.193	0.449	1.213	1.999	0.736
2	0.449	0.036*	1.567	1.029	2.387
3	0.148	0.680	1.160	0.573	2.347

*Significant at $P < 0.05$ for comparisons among model variables.



Model Variable

Figure 3.1. Latino Environmental Concern (LEC) scale mean score by (a) Gender, (b) Religiosity, (c) Political Candidate's Environmental Position, (d) Mother's Education, (e) Combined Parent Income, and (f) Grandparents Born in U.S.

Table 3. 5. Comparison of independent variables by survey question (n=15) grouped by environmental theme^a and level of significance^b, 2005.

Independent Variable	7	9	1	2	3	4	10	11	8	13	14	15	5	6	12
<i>High^b</i>															
Gender	X				X	X	X				X		X		X
Environmental identification		X	X	X		X				X	X	X		X	
Position on environmental issues	X				X	X		X			X	X	X		
Combined parent income	X			X		X		X	X	X		X		X	
<i>Moderate^b</i>															
Age	X								X	X		X			
Religiosity	X	X	X				X				X	X			
Mother education			X	X		X	X			X					
Number of grandparents born in U.S.							X					X			

Table 3.5. Continued.

Independent Variable	Ecological Catastrophe ^a	1	2	3	4	10	11	8	13	14	15	5	6	12	Ecological Participation ^a	Human Domination ^a
<i>Low^b</i>	7	9														
Acculturation index																
Religious preference	X															X
Political affiliation					X			X								
Father education															X	

^aFifteen survey questions grouped into 1 of 4 environmental themes:
Ecological Catastrophe (EC): 7 = We humans are approaching the limit of earth's room and resources, 9 = When humans change the natural environment, it often produces disastrous results.
Environmental Future (EF): 1 = We worry too much about the future of the environment and not enough about prices and jobs today, 2 = People worry too much about human progress harming the environment, 3 = There are more important things to do in life than protect the environment, 4 = Many of the claims about environmental threats are exaggerated, 10 = We are not harming the environment when we do normal things like driving cars and running air conditioners, 11 = People worry too much about the threats to the global environment.
Environmental Participation (EP): 8 = To help solve the earth's environmental problems, the U.S. and other rich countries will have to reduce their consumption of resources, 13 = There is no point in doing what I can for the environment unless others do the same, 14 = It is too difficult for someone like me to do much about the environment, 15 = I do what is right for the environment, even when it costs more money or takes up more time.
Human Domination (HD): 5 = Too much emphasis is placed on conserving resources, not enough on using them for current needs, 6 = Humans do not need to adapt to the natural environment because they can change it to suit their needs, 12 = Plants and animals exist primarily to be used by humans.
^bIndependent variables tested for each survey question. Independent variables found to be significant ($P < 0.05$, represented by "X") for at least 1 survey question in each environmental theme defined as "high", 2-3 defined as "moderate", and < 1 defined as "low".

Discussion

The analysis identified 4 demographic variables that collectively predicted environmental concern in my sample of Texas Latino community college and university students: gender, political candidate's position on the environment, mother's education level, and combined parent income. Understanding the relationship of these demographic factors in predicting environmental concern is important in policy formation, implementing new outreach programs, and in gaining general agency support (Duda and Brown 1999, Decker et al. 2001). A discussion of each of these factors is provided below.

Gender

Gender emerged as an important predictor of LEC in my study of Texas Latinos (Figure 3.1). I found that women were more concerned about the environment than men. My finding is congruent with findings reported by Bradley et al. (1997), Earle (1998) and Klineberg et al. (1998) on other Latino populations. The significance of gender is important for example, if a natural resource agency wishes to implement a new program. My results suggest that women would be more receptive to outreach programs that promote environmental stewardship when compared to men. Earle (1998) found that gender, among other factors, strongly influenced attitudes toward natural resources. The importance of gender was substantiated in my comparison of the individual LEC score to demographic variables (Table 3.5). Study results suggest gender should be considered when working with Texas Latinos.

Political candidate's environmental position

I found that a political candidate's environmental position was important in predicting participants' environmental concern for Texas Latinos. In general, LEC scores increased when respondents placed a great deal of value on a political candidate's environmental position (Figure 3.3). This indicates that a respondent's vote may be influenced by a political candidate's environmental position. Knowing that Latinos are influenced by a candidate's stance on environmental issues can be useful to natural resource agencies who wish to engage the Latino community in program development and implementation. Latinos who are sympathetic to environmental issues will be easier to engage.

Mother education

Mother's level of education was a strong predictor for respondents' environmental concern. In general, the mean LEC score decreased as mother's level of education increased. This finding is in line with Earle (1998) who hypothesized that parental attitudes may influence their children's attitude toward natural resources. However, my findings are counter-intuitive, for one would suppose that higher educational attainment would result in higher LEC scores. I hypothesize that women with higher education levels may not have an opportunity to foster environmental stewardship in their children because of various work schedules and responsibilities. Furthermore, a higher education usually translates into a higher household income. In turn, a higher income may foster a consumption ethic rather than a conservation ethic in children with higher educated mothers. On the other hand, Latino mothers more likely

belong to a lower income household when compared to higher educated women; thus, the less educated Latino mother will instead foster a conservation ethic as opposed to a consumption ethic. This finding is meaningful to agencies who want to promote a conservation ethic. My study findings suggest that Latino children of higher educated mothers are not necessarily more environmentally friendly than children of less educated mothers. This may be an indication of the difficulty agencies are having with imparting conservation awareness and ethics. Developing programs that convey a conservation ethic will help natural resource agencies engage the Latino community.

Combined parent income

Finally, I found that respondent's combined parent income predicted environmental concern among the Texas Latinos surveyed. Earle (1998) found that income strongly influenced attitudes toward natural resources. Knowing that parent combined annual income is important to imparting environmentally sympathetic attitudes, agencies should consider targeting lower income individuals and making participation more accessible when developing programs for the Latino community. The importance of combined parent income was supported by my comparison of the individual LEC score to demographic variables (Table 3.5). Study results suggest combined parent income should be considered when developing programs for Texas Latinos. This study finding is counterintuitive given my results for mother's education. These findings need to be further explored.

Acculturation

The number of grandparents born in the U.S. had a weak influence on participant responses (Table 3.5). More information than was gathered is needed to accurately determine a participant's generation; thus, this finding, while suggestive, is inconclusive. Further studies using generation, the number of sets of grandparents that are native-born as opposed to the total number of grandparents born in the U.S, should be performed in order to determine its influence on attitude formation. I recommend using questions that involve check boxes when referring to generations of relatives born in the U.S., e.g., grandparent, great-grandparent, etc. in order to obtain a better measurement of generation. In my study of Texas Latino community college and university students, acculturation did not emerge as a significant predictor of attitudes toward the environment and natural resources. There are several possible explanations for this finding. First, community college and university students, in general, have already experienced multiple years of total immersion in the U.S. education system; they have by default mastered the English language, and language plays a central role in the acculturation process. My survey participants by default fell within Levels II, III, and IV of the acculturation scale. Thus, I propose my study sample, while it may be representative of Latinos with higher educational attainment, is not representative of the Texas Latino population. To obtain a more representative sample and overcome the shortcomings of my study, I recommend using a sampling method that incorporates a mix-method, multi-site approach that will allow the research to capture the diversity that exists within the Latino community.

Management Implications

The rapid growth of the Texas Latino population has many implications for natural resource management agencies from advertising to program implementation. In order to increase Latino participation in these areas, current programs must be made more accessible to the Latino community. The most frequently suggested method to consider involves an increased availability of Spanish language materials that are sensitive to the Latino community's cultural and regional differences. Other improvements could be made in planning and developing calendar of events, event fliers, websites, educational programs, and program promotions. Providing transportation from a specified location to and from events may increase Latino participation. Incentive programs could be established similar to Texas Parks and Wildlife Department's (TPWD) Family Fishing Celebration event where fishing license requirements for families are waived for a year at state parks. Another TPWD program, "Kids ride free," is a collaborative effort with the Texas State Railroad. This collaborative effort also considers socioeconomic factors. Waiving fees and incorporating more family-oriented activities into existing programs would make participation more accessible to the Latino community. Furthermore, targeting Latino specific areas and collaborating with organizations who work with the Latino community (church groups, community groups, schools, unions) provide resource managers an opportunity to learn more about this emerging stakeholder from those who interact with them on a regular basis. It also affords managers an opportunity to actively engage the Latino stakeholder. My study suggests that gender, mother's education level,

combined parent income, and a political candidate's environmental position influence Latino attitudes toward the environment and natural resources. By targeting Latino women, especially those who are higher educated, natural resource agencies can impart a stronger conservation ethic among the Latino community. Latinos whose vote is influenced by a political candidate's environmental position and Latino households with higher income levels are 2 Latino subgroups that could easily be engaged in natural resource programs.

CHAPTER IV

CONCLUSIONS AND IMPLICATIONS

The rapid growth of the Latino community presents unique challenges for natural resource management agencies, especially those in Texas where Latinos have become the largest ethnic minority (Chapter I). Engaging the Latino stakeholder is now essential for the conservation and management of natural resources. Gaining support for current and future natural resource management programs requires a reciprocal partnership between natural resource agencies and the Latino community. Current and future programs, partnerships, and research must be culturally sensitive and relevant to the Latino community. Understanding differences in stakeholder attitudes and knowledge is needed for the overall acceptance and success of management decisions made by wildlife agencies. My thesis objectives were to: (1) identify and synthesize research findings that focus on Latino attitudes toward natural resources and the environment (Chapter II), and (2) survey Texas Latinos and identify variables that influence environmental attitudes, knowledge, and concerns toward the environment and natural resources (Chapter III). Here I present research highlights for both objectives and the implications of these findings.

First and foremost, I found that research on Latino environmental and natural resource attitudes is limited. From my literature review of 25 databases and 29 word combinations (Chapter II), I found only 17 relevant articles on Latinos and the environment. There clearly is a deficit of knowledge regarding Latino attitudes toward natural resources, wildlife, and the environment. Future research in this area is

imperative, particularly for public management agencies that need to engage this stakeholder in decision-making processes and management directives. From these important but limited studies, my findings suggest that important factors, such as formal measurements for acculturation and generation, were not adequately measured or considered in most of these studies. Therefore, in addition to more attitudinal research among the Latino community about natural resources/environment, researchers must attempt to capture the heterogeneity of the Latino community and apply a methodology capable of encompassing ethnic specific characteristics.

To address the current gaps in our knowledge of Latinos and the environment (Chapter II), I developed a culturally relevant and sensitive environmental concern scale, the Latino Environmental Concern Scale (LEC), from 3 common indices measuring environmental concern: General Social Survey (GSS 2003), New Ecological Paradigm (NEcP, Dunlap et al. 2000), and the Texas Biennial Environmental Survey [TBES], Klineberg 1998). I tested the instrument on a sample of Texas Latino college and university students (Chapter III). I found 4 variables were important in predicting LEC among Latinos: gender, political candidate's environmental position, mother's education, and combined parent income (Chapter III). Federal and state natural resource management agencies that wish to implement programs targeting the Latino community should consider the fact that Latinos are not monolithic.

I hypothesized that acculturation would be an important factor in predicting LEC; however, acculturation level did not prove significant in predicting Latino attitudes toward natural resources and the environment. This is not to say acculturation is not an

important factor to consider when working with the Latino community. Previous research (Marín and Marín 1991) states the importance of acculturation in attitudinal research with Latinos. Higher levels of acculturation result in attitude and behaviors closely associated with the attitudes and behaviors of the dominant population. I attribute the lack of significance in my study to the use of a non-representative Latino sample (college and university students) and small sample sizes for students in the lowest ($n = 3$) and highest ($n = 5$) acculturation categories. I would suggest that a multi-method and multi-site approach be used to overcome some of these limitations and to better understand the acculturation, Latinos, and the environment. Future research is required to determine the influence of acculturation and other cultural factors on Latino attitudes toward natural resources and the environment. This information will benefit natural resource managers as they try to fulfill their mission of conserving natural resources.

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APPENDIX

Script for Email Solicitation

Subject Heading: Graduate student would appreciate your help conducting an attitude survey

Dear Professor,

My name is Angelica Lopez. I am a master's student at Texas A&M University, in the College of Agriculture and Life Sciences, Department of Agricultural Education, working under the direction of Dr. Cruz Torres. I am conducting research on Texas college and university students' attitudes toward natural resources and the environment. I am writing to provide background to the project and to request your assistance in implementing a survey as part of my thesis project.

My thesis project involves developing a written questionnaire and using it to determine students' attitudes toward natural resources and the environment. The multiple-choice and short answer questionnaire will take no longer than 20 minutes to complete. My intent is to administer the questionnaire, targeting students attending Texas rural, urban, and metropolitan colleges and universities, in the Spring 2005 semester. Of course, this is contingent on your willingness to allow me 15-20 minutes of your class time to survey your students. I have obtained the proper Institutional Review Board protocol to administer the one-time survey. Would you assist me in my thesis project and allow me to survey your students?

If you are interested, I can call you to discuss the process, survey questions, possible dates/times, and any other concerns you might have.

I thank you in advance for your consideration of my request, and look forward to hearing from you soon. You may contact me at (979) 778-3615 (home), (979) 324-9626 (cell), or at keydeer@tamu.edu if you are interested in participating.

Thank you for your time and consideration.

Sincerely,

Angelica Lopez
M.S. student

Script for Telephone Solicitation

Angelica Lopez = AL

AL: Hello Dr. My name is Angelica Lopez. I am a master's student at Texas A&M University, in the College of Agriculture and Life Sciences, Department of Agricultural Education, working under the direction of Dr. Cruz Torres. I am conducting research on Texas community college and university students' attitudes toward natural resources and the environment. I obtained your name from your school's website and am calling to provide background to the project and to request your assistance in implementing a survey as part of my thesis project. Would you be interested in finding out more about my project?

If professor is interested in learning more:

AL: My thesis project involves developing a written questionnaire and using it to determine students' attitudes toward natural resources and the environment. The multiple-choice and short answer questionnaire will take approximately 20 minutes to complete. My intent is to administer the one-time questionnaire, targeting students attending Texas rural, urban, and metropolitan colleges and universities, in the Spring 2005 semester. Of course, this is contingent on your willingness to allow me 15-20 minutes of your class time to survey your students. I have obtained the proper Institutional Review Board protocol to administer the one-time survey. Would you assist me in my thesis project and allow me to survey your students?

If professor is not interested in participating:

AL: I can understand your reservations, and I do thank you for your time. If you were to change your mind, my name is Angelica Lopez and my e-mail address keydeer@tamu.edu. Again, thanks for your consideration and have a nice day. Goodbye.

If professor is interested in participating:

AL: I'm so glad you are interested in participating in this research study. Basically, all we need is approximately 20 minutes of your time during your regularly scheduled lecture(s) so that your students may fill out the questionnaire. This is a one-time survey. Would you like to schedule a survey date and time for the Spring 2005 semester?

Exchange of information and scheduling will follow.

If professor is no longer interested in participating:

AL: I can understand your reservations, and I do thank you for your time. If you were to change your mind, my name is Angelica Lopez and my e-mail address keydeer@tamu.edu. Again, thanks for your consideration and have a nice day. Goodbye

Description of Natural Resources and Environmental Attitude Survey

This survey is designed to determine the attitudes of Hispanic community college and university students toward natural resources and the environment. It includes questions from the following scales: Assimilation Rating Scale for Mexican Americans – II, (Cuéllar, ...), New Environment Paradigm Scale (Dunlap and Van Liere, ...), GSS Environmental Module Survey Questions, the Texas Biennial Environmental Survey (Klineberg, ...), and questions designed by Angelica Lopez and Dr. Cruz C. Torres. The survey's answer format includes fill in the blank and multiple choice items (Likert Scale). All answers will be provided on the questionnaire itself. Pencils will be provided to the participants for survey completion.

Script Preceding Questionnaire

Hello. My name is Angelica Lopez. I am a master's student at Texas A&M University, in the College of Agriculture and Life Sciences, Department of Agricultural Education, working under the direction of Dr. Cruz Torres. I am conducting research on Texas community college and university students' attitudes toward natural resources and the environment. Dr. _____ has given me permission to administer this survey that will take approximately 20 minutes to complete. There are no right or wrong answers to this survey; however, I ask that you respond sincerely and truthfully to each question. The information you provide will remain strictly confidential. You will not be penalized for not participating in this survey.

Please read each document thoroughly and mark your responses where indicated. At the end of the questionnaire, I have provided my contact information in case you should ever have any questions about my research.

Thanks for your cooperation. You may begin.

Texas Latino Knowledge and Attitudes toward Natural Resources

I voluntarily and of my own free will consent to be a participant in the research project entitled “Texas Latino Knowledge and Attitudes toward Natural Resources.” This research is being conducted by Angelica Lopez, who is a graduate student at Texas A&M University in College Station, TX. I understand that the purpose of this research is to determine attitudes toward natural resources and the environment.

I understand that if I participate in this research, I will be asked questions about my beliefs regarding natural resources and the environment, and I agree to answer the questions to the best of my abilities. I also understand that there is no risk associated with participating in this research project. My participation will require filling out a questionnaire that will take approximately 20 minutes. I understand that I will be 1 among 500 participants in this study. I understand that I will not receive any compensation from the researcher for participating in this research.

I understand that there will be no penalty should I choose not to participate in this research, and I may discontinue at any time without penalty. I also have been assured that all the answers and information I provide will be kept entirely confidential and will be identified by an alphanumeric code. My name will never appear on any research document, and no single individual’s answers will be reported. Only group findings will be reported.

I understand that this research may help us learn more about Texas’ Hispanic attitudes toward natural resources and the environment, and I retain the right to ask and have answered any questions I have about the research. Any questions I have asked have been satisfactorily answered. I also retain the right to receive a summary of the research results after the project has been completed if I so request. These assurances have been provided to me by Ms. Angelica Lopez. I also understand that I will receive a copy of this form for further reference.

I understand that this research study has been reviewed and approved by the Institutional Review Board – Human Subjects in Research, Texas A&M University. For research-related problems or questions regarding subjects’ rights, I can contact the Institutional Review Board through Dr. Michael W. Buckley, Director of Research Compliance, Office of the Vice President for Research at (979) 458-4067 (mwbuckley@tamu.edu).

I have read and understand this consent form. By signing below I agree to participate in this research study.

Participant Signature _____ Date _____

Investigator Signature _____ Date _____

If you have any questions or concerns, please feel free to contact:

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- I. People can help the environment in many different ways; here are a few of the possible activities individuals can participate in. During the past year, how often have you or other household members participated in any of the following activities? The “not available” response applies for communities where the service/organization group is not available.

	Always	Often	Sometimes	Never	Not Available
a1. Saved glass, plastic, cans, bottles, or newspapers for recycling	1	2	3	4	5
b1. Contributed time or money to an environmental or conservation group	1	2	3	4	5
c1. Participated in a specific environmental project in your community, such as picking up litter or planting trees	1	2	3	4	5
d1. Specifically avoided buying or using environmentally damaging products, such as non-biodegradable plastics or high-phosphate detergents	1	2	3	4	5

	Yes	No
a2. Are you a member of any group whose main aim is to preserve or protect the environment?	1	2
b2. In the last five years, have you signed a petition about an environmental issue?	1	2
c2. In the last five years, have you taken part in a protest or demonstration about an environmental issue?	1	2
d2. Does your neighborhood have curbside recycling?	1	2
e2. Is there a “household hazardous waste disposal site” in your area?		
1 Yes		
2 No		
3 Don’t know		
f2. During past year, have you personally changed the oil in a car or truck?	1	2
If yes, how did you dispose of the used oil?		
1 Gas station, service center, etc.		
2 In yard, trash, etc.		
3 Other _____(Please specify.)		
g2. Do you have a lawn or yard for which you are responsible?	1	2
If yes, during past year, how many times did you use fertilizers on the lawn?		
1 Once every 3 months		
2 Once or twice in year		
3 Not at all in past year		

II. People hold very different opinions about the usefulness of individual actions and the overall level of concern we should have about the environment. Please indicate your level of agreement with the following questions.

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
a. We worry too much about the future of the environment and not enough about prices and jobs today.	1	2	3	4	5
b. People worry too much about human progress harming the environment.	1	2	3	4	5
c. There are more important things to do in life than protect the environment.	1	2	3	4	5
d. Many of the claims about environmental threats are exaggerated.	1	2	3	4	5
e. Too much emphasis is placed on conserving resources, not enough on using them for current needs.	1	2	3	4	5
f. Humans do not need to adapt to the natural environment because they can change it to suit their needs.	1	2	3	4	5
g. We humans are approaching the limits of the earth's room and resources.	1	2	3	4	5
h. To help solve the earth's environmental problems, the U.S. and other rich countries will have to reduce their consumption of resources.	1	2	3	4	5
i. When humans change the natural environment, it often produces disastrous results.	1	2	3	4	5
j. We are not harming the environment when we do normal things, like driving cars and running air conditioners.	1	2	3	4	5
k. People worry too much about threats to the global environment.	1	2	3	4	5
l. Plants and animals exist primarily to be used by humans.	1	2	3	4	5
m. There is no point in doing what I can for the environment unless others do the same.	1	2	3	4	5
n. It is too difficult for someone like me to do much about the environment.	1	2	3	4	5
o. I do what is right for the	1	2	3	4	5

environment, even when it costs
more money or takes up more time.

III. Environmental concerns occur at different levels, e.g., local, state, national and global. Below is a list of some of the most common environmental concerns. Please indicate how serious you think each problem is, first in the global environment, then in State of Texas as a whole, and finally in your own community.

	Very Serious	Somewhat Serious	Not very Serious	Don't Know
Global Environment				
a. How serious a problem would you say is the "greenhouse effect," or the threat of global warming?	1	2	3	4
b. The world's population is growing rapidly. How serious a threat to the global environment would you say this is?	1	2	3	4
c. How serious a threat is the destruction of habitat to the global environment?	1	2	3	4
In the State of Texas, how serious a problem is				
a. air pollution?	1	2	3	4
b. the management of hazardous wastes?	1	2	3	4
c. the pollution of lakes, streams, or coastal areas?	1	2	3	4
d. exposure to dangerous substances such as lead paint, asbestos, or pesticides?	1	2	3	4
In your community, how serious a problem is				
a. air pollution?	1	2	3	4
b. the management of hazardous wastes?	1	2	3	4
c. the pollution of lakes streams, or coastal areas?	1	2	3	4
d. exposure to dangerous substances such as lead paint, asbestos, or pesticides?	1	2	3	4

IV. Different entities offer us conflicting information regarding environmental issues. How much do you trust information provided by the following groups?

A great deal	Quite a lot	Some	Not much	Hardly
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	of trust	of trust	trust	trust	any trust
a. Business and industry	1	2	3	4	5
b. Environmental groups	1	2	3	4	5
c. Federal government departments	1	2	3	4	5
d. State government departments	1	2	3	4	5
e. Newspapers	1	2	3	4	5
f. Radio or TV programs	1	2	3	4	5
g. University research centers	1	2	3	4	5

V. We are often asked to choose between environmental issues and economic or growth potential. Indicate how strongly you agree or disagree with the following statements.

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
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In General

a. In order to protect the environment America needs economic growth.	1	2	3	4	5
b. Economic growth always harms the environment.	1	2	3	4	5
c. Economic progress in America will slow down unless we look after the environment better.	1	2	3	4	5
d. Improving the environment will create many jobs and help the national economy.	1	2	3	4	5
e. Improving the environment will slow down economic growth and cost many jobs.	1	2	3	4	5

In the State of Texas

a. We need better land-use planning to guide development.	1	2	3	4	5
b. People and industry should be free to build where they	1	2	3	4	5

	want.					
c.	We need to spend more funds to buy additional land for more protected areas as preserves or parks.	1	2	3	4	5

In your community

a.	We need better land-use planning to guide development.	1	2	3	4	5
b.	People and industry should be free to build where they want.	1	2	3	4	5
c.	We need to spend more funds to buy additional land for more protected areas as preserves or parks.	1	2	3	4	5

VI. Given that we are asked to choose between environmental issues and economic or growth potential, how willing are you to personally invest in the environment? Please indicate how willing you are to do the following.

	Very Willing	Fairly Willing	Neither willing nor Unwilling	Not very Willing	Not at all Willing
a. How willing would you be to pay higher prices in order to protect the environment?	1	2	3	4	5
b. How willing would you be to pay higher taxes in order to protect the environment?	1	2	3	4	5
c. How willing would you be to accept cuts in your standard of living in order to protect the environment?	1	2	3	4	5
d. How willing would you be to pay more tax monies to protect wilderness areas for endangered species?	1	2	3	4	5
e. How willing would you be to pay an additional 25 cents on water bill for new sewers to prevent polluted runoff from spilling into waterways?	1	2	3	4	5

VII. Americans have their own personal opinions about the level of involvement that government should have in certain issues, such as government regulations on our daily lives, on business, on environment issues, etc. When it comes to government, which of the following comes closest to **your** views?

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
a. Government should let ordinary people decide for themselves how to protect the environment, even if it means they do not always do the right thing.	1	2	3	4	5
b. Government should pass laws to make ordinary people protect the environment, even if it interferes with people's right to make their own decisions.	1	2	3	4	5
c. Government should let businesses decide for themselves how to protect the environment, even if it means they do not always do the right thing.	1	2	3	4	5
d. Government should pass laws to make businesses protect the environment, even if it interferes with business' right to make their own decisions.	1	2	3	4	5
e. On balance, business and industry are making more of an effort to look after the environment.	1	2	3	4	5
f. On balance, people in general are making more of an effort to look after the environment.	1	2	3	4	5
g. On balance, the government is making more of an effort to look after the environment.	1	2	3	4	5
h. The federal government interferes too much in our daily lives.	1	2	3	4	5
i. Government regulation of business always does more harm than good.	1	2	3	4	5
j. Government is doing too much that should be left to individuals and businesses.	1	2	3	4	5
k. Government should do more to solve our country's problems.	1	2	3	4	5
l. Stronger government regulation	1	2	3	4	5

is necessary to control industrial pollution.

VIII. Americans have a love affair with sports and outdoor recreation (hiking, boating, fishing, hunting, camping, etc.). During the past year, how often have you personally participated in any of the following leisure activities?

	Several Times	Once or Twice	Not at All
a. Gone swimming in a lake, river, or bay in Texas?	1	2	3
b. Visited a state park or other natural area in Texas?	1	2	3
c. Gone boating or fishing somewhere in Texas?	1	2	3

Below is a list of reasons why people might not participate in outdoor activities (e.g. example: hiking, boating, fishing, etc.) as often as they want. Have the following reasons kept you from participating in **any** outdoor activity? For each reason, please indicate whether it has kept you from participating in **any** outdoor activity.

	Yes	No
a. Not enough time.	1	2
b. Not enough money.	1	2
c. Personal health reasons.	1	2
d. No one to do activities with.	1	2
e. Inadequate transportation.	1	2
f. Crowded activity areas.	1	2
g. Personal safety problems in activity areas.	1	2
h. Inadequate facilities in activity areas.	1	2
i. Poorly maintained activity areas.	1	2
j. Pollution problems in activity areas.	1	2
k. Inadequate information on places to do activities.	1	2
l. I have a physically limiting condition and do not have assistance or equipment to do activities.	1	2
m. A member of my household has a disability that limits my participation in outdoor recreation.	1	2
n. Outdoor pests, such as mosquitoes.	1	2
Other. (Please specify.) _____		

IX. Now I am going to ask you about several things that some people do. Assuming that you do these things, how often do you participate in these activities? Please circle the most appropriate response.

Not at all	Very little or not very	Moderately	Much or very often	Extremely often or
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		often				almost always
a.	I speak English.	1	2	3	4	5
b.	I speak Spanish.	1	2	3	4	5
c.	I enjoy speaking Spanish.	1	2	3	4	5
d.	I associate with Anglos.	1	2	3	4	5
e.	I associate with Mexicans and/or Mexican Americans.	1	2	3	4	5
f.	I enjoy listening to Spanish language music.	1	2	3	4	5
g.	I enjoy listening to English language music.	1	2	3	4	5
h.	I enjoy Spanish language TV.	1	2	3	4	5
i.	I enjoy English language TV.	1	2	3	4	5
j.	I enjoy English language movies.	1	2	3	4	5
k.	I enjoy Spanish language movies.	1	2	3	4	5
l.	I enjoy reading (e.g., books in Spanish).	1	2	3	4	5
m.	I enjoy reading (e.g., books in English).	1	2	3	4	5
n.	I write (e.g., letters in Spanish).	1	2	3	4	5
o.	I write (e.g., letters in English).	1	2	3	4	5
p.	My thinking is done in the English language.	1	2	3	4	5
q.	My thinking is done in the Spanish language.	1	2	3	4	5
r.	My contact with Mexico has been	1	2	3	4	5
s.	My contact with the USA has been	1	2	3	4	5
t.	My friends, while I was growing up, were of Mexican origin.	1	2	3	4	5
u.	My friends, while I was growing up, were of Anglo origin.	1	2	3	4	5
v.	My family cooks Mexican foods.	1	2	3	4	5

w. My friends now are of Anglo origin.	1	2	3	4	5
x. My friends now are of Mexican origin.	1	2	3	4	5

X. People think of themselves in many ways, below are some possibilities. For each item listed, please indicate which is in closer agreement with your personal views.

	Not at all	Very little or not very often	Moderately	Much or very often	Extremely often or almost always
a. My father identifies or identified himself as "Mexicano."	1	2	3	4	5
b. My mother identifies or identified herself as "Mexicana."	1	2	3	4	5
c. I like to identify myself as an Anglo American.	1	2	3	4	5
d. I like to identify myself as a Mexican American.	1	2	3	4	5
e. I like to identify myself as a Mexican.	1	2	3	4	5
f. I like to identify myself as an American.	1	2	3	4	5

XI. Demographic Information

1. Next we would like to ask you some questions that will help us get to know you better. Please answer all questions where indicated.

a. What is your major? _____

b. What is your academic classification?

- 1 Freshman
- 2 Sophomore
- 3 Junior
- 4 Senior
- 5 Other (Please specify.) _____

c. What is your age? _____

d. What is your sex?

- 1 Male
- 2 Female

e. Which of the following ethnicities best describes you?

- 1 Mexican (born in Mexico)
- 2 Mexican-American (born in the United States)
- 3 Anglo-American

4 Other Please Specify. _____

2. Religious Preference

a. Please mark the number that illustrates your religious preference? (Please indicate one.)

- 1 Catholic
- 2 Protestant (Specify) _____
- 3 Non-Christian (Specify) _____

b. How often do you attend religious services?

- | | | |
|---------------------------------|------------------------|------------------------|
| 1 Never | 4 Several times a year | 7 Nearly every week |
| 2 Less than once
a year | 5 About once a month | 8 Every week |
| 3 About once or
twice a year | 6 2-3 times a month | 9 Several times a week |

c. In the past 30 days, did you attend a religious service, other than a wedding or funeral?

- 1 Yes
- 2 No

3. Political Orientation

a. Do you consider yourself an active environmentalist, sympathetic to environmental causes but not active, neutral, or unsympathetic to environmental causes?

- 1 Active
- 2 Sympathetic
- 3 Neutral
- 4 Unsympathetic
- 5 Don't know

b. Generally speaking, do you usually think of yourself as a...?

- 1 Republican
- 2 Democrat
- 3 Independent
- 4 Other (Please specify.) _____

c. Did you get a chance to vote in the last election?

- 1 Yes
- 2 No

d. How important is a candidate's position on environmental issues in influencing the way you vote?

- 1 Very important
- 2 Somewhat important
- 3 Not very important

4. Below are some questions about place and years of residence for yourself and your parents. Please answer where indicated for both yourself and your parents.

a. What is your hometown?

(Please specify with **City** and **State**)

	Yourself	Your Mother	Your Father
b. Please state country of birth for...			
c. If not born in US, please provide the years of residence in US for ...			
d. Were all of your four grandparents born in the United States?			
1 Yes			
2 No			
e. If not, how many were born in the United States? _____ (Please specify.)			

5. Education

- a. What is the **highest grade completed** in either elementary or high school for which your **mother** and **father** received credit? (Please Specify.)

Mother _____ **Father** _____

- b. For each parent, please mark whether they have attended / received a...

	<u>Mother</u>		<u>Father</u>	
	Yes	No	Yes	No
1. High school diploma?	1	2	1	2
2. Technical school?	1	2	1	2
3. College, but no degree?	1	2	1	2
4. College degree?	1	2	1	2
5. Graduate degree?	1	2	1	2

6. Income:

- a. Are you employed?

1 Yes

2 No

- b. Below is a list of income categories. First, please select the income category that is closest to **your annual income in US dollars**. Then, please select the income category that is closest to your **parent's combined annual income in US dollars**.

Your Annual Income		Parent's Combined Annual Income	
1	Under \$1,000	1	Under \$1,000
2	\$ 1,000 to 2,999	2	\$ 1,000 to 2,999
3	\$ 3,000 to 3,999	3	\$ 3,000 to 3,999
4	\$ 4,000 to 4,999	4	\$ 4,000 to 4,999
5	\$ 5,000 to 5,999	5	\$ 5,000 to 5,999
6	\$ 6,000 to 6,999	6	\$ 6,000 to 6,999
7	\$ 7,000 to 7,999	7	\$ 7,000 to 7,999
8	\$ 8,000 to 9,999	8	\$ 8,000 to 9,999
9	\$10,000 to 14,999	9	\$10,000 to 14,999
10	\$15,000 to 19,999	10	\$15,000 to 19,999

11	\$20,000 to 24,999	11	\$20,000 to 24,999
12	\$25,000 to 34,999	12	\$25,000 to 34,999
13	\$35,000 to 39,999	13	\$35,000 to 39,999
14	\$40,000 to 49,999	14	\$40,000 to 49,999
15	\$50,000 or 59,999	15	\$50,000 or 59,999
16	\$60,000 to 74,999	16	\$60,000 to 74,999
17	\$75,000 to 89,999	17	\$75,000 to 89,999
18	\$90,000 to 109,999	18	\$90,000 to 109,999
19	\$110,000 or over	19	\$110,000 or over

VITA

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EDUCATION:

Master of Science, Agricultural Education, Texas A&M University (TAMU), 12/2005.

Thesis: Texas Latino knowledge and attitudes toward natural resources.

Bachelor of Science, Agricultural Education, TAMU, 8/1999.

Bachelor of Science, Animal Science, TAMU, 12/1997.

WORK EXPERIENCE:

Spanish Teacher, Iola High School, Iola, TX, 8/2001-5/2003.

Child Case Manager, Guidance Clinic of the Upper Keys, 10/2000-7/2001.

Outreach Worker, Guidance Clinic of the Upper Keys, 2/2000-10/2000.

PUBLICATIONS:

Lopez, R. R., A. Lopez, R. N. Wilkins, C. C. Torres, R. Valdez, J. G. Teer, and G. Bowser. 2005. Changing Hispanic demographics: challenges in natural resource management. *Wildlife Society Bulletin* 33(2): XX-XX.

PRESENTATIONS:

Changing Hispanic demographics: Challenges in natural resource management. 2005. Texas A&M University Agricultural Program Annual Conference, College Station, Texas. Poster.

Hispanic demographics and natural resource management. 2004. Society for Advancement of Chicanos and Native American Scientists, Austin, Texas. Poster.

Texas Hispanic demographics: a new stakeholder in natural resource management. 2004. Eleventh Annual Conference of The Wildlife Society, Calgary, Alberta. Poster.

GRANTS:

Understanding Hispanic attitudes and knowledge in natural resources. 2004. Harvey Weil Foundation, \$18,000. 1 year.

OTHER:

Phi Kappa Phi, member, 2004-present

Society for Advancement of Chicanos and Native American Scientists, member, 2004-present.